

THE MILLING WORLD

AND

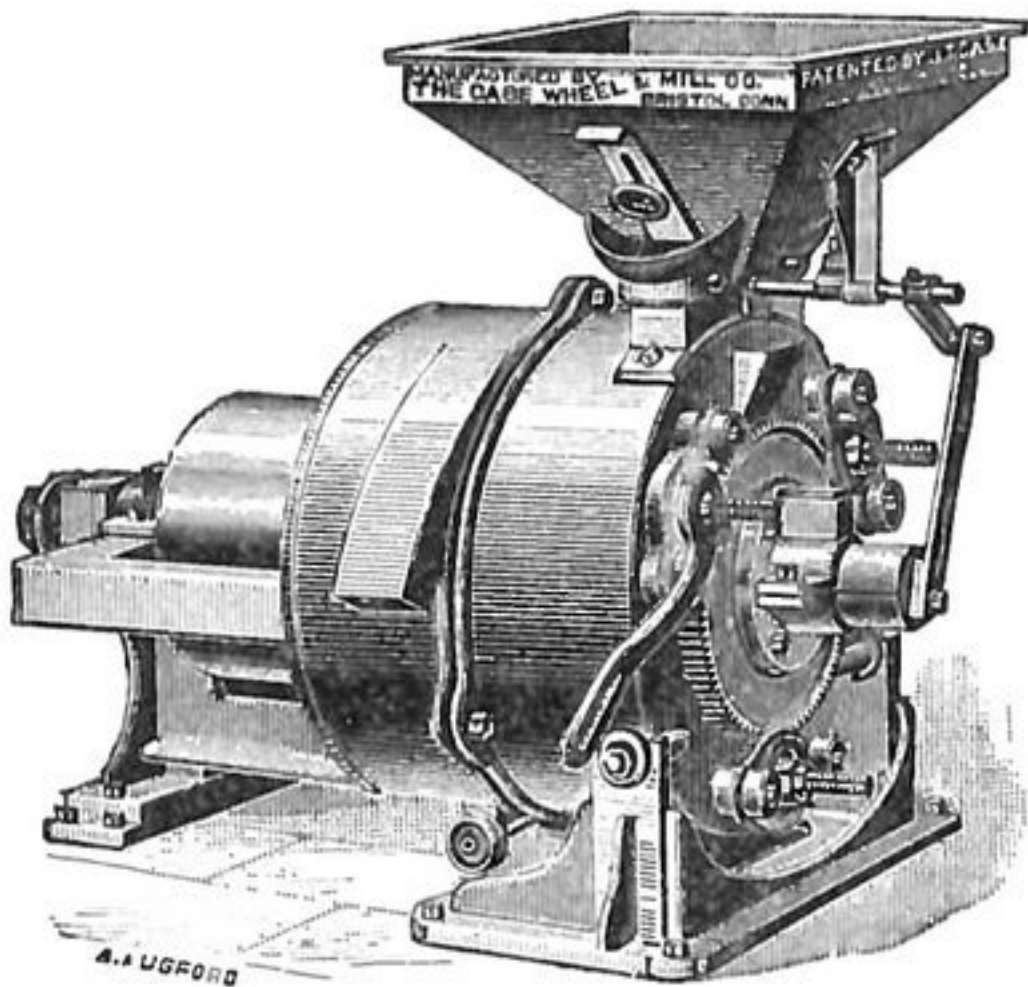
CHRONICLE OF THE GRAIN AND FLOUR TRADE

PUBLISHED EVERY MONDAY MORNING.

VOL. XX. No. 3.

BUFFALO, N. Y., MARCH 18, 1889.

\$1.50 PER YEAR.



VICTORY OVER ALL OTHERS. SINGLE & DOUBLE VERTICAL GRINDING MILLS.

(J. T. CASE'S PATENT.)

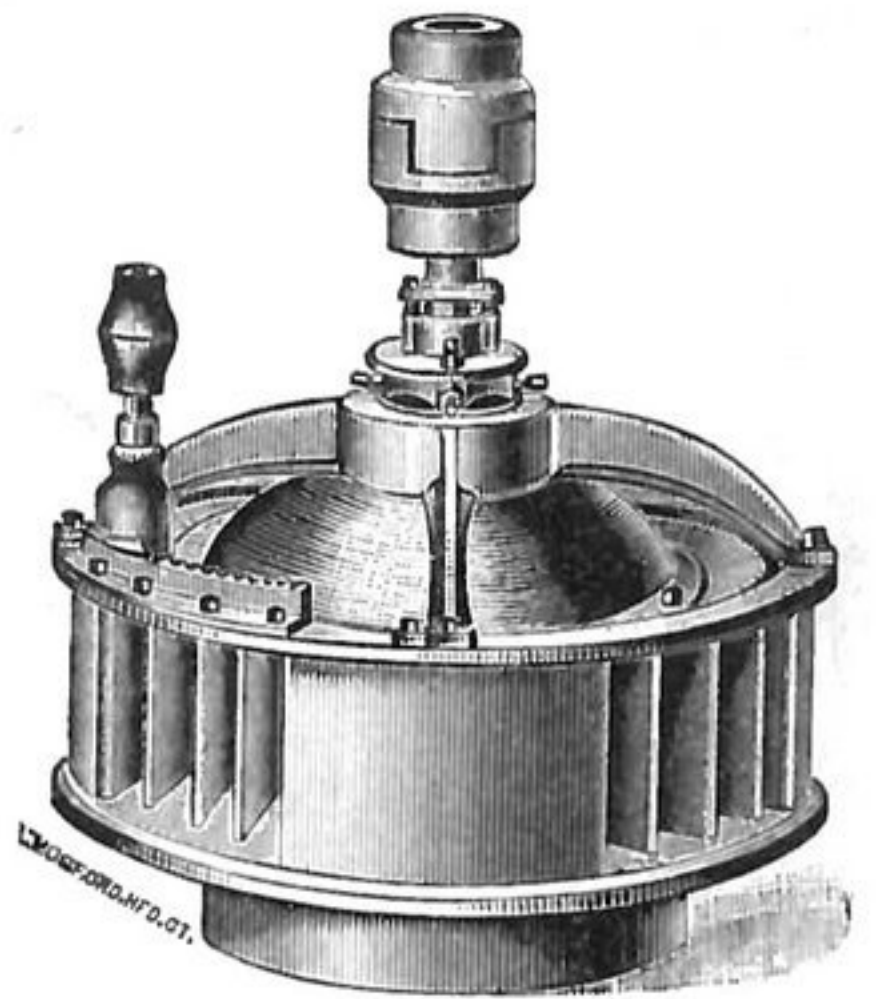
FACTS ARE MIGHTIER THAN ASSERTIONS. READ WHAT THEY SAY:

"Our 20-inch mill made by the Case Wheel & Mill Co. is in every respect satisfactory, easy to handle, and best results obtained of any mill in the country, with same quantity coal and power."—A. S. RUSSELL & Co., Meriden, Conn.
 "Superior to any mill in use."—Geo. WESTON, Bristol, Conn.
 "The best satisfaction in quantity and quality."—CHILD'S ELEVATOR, Manchester, Ct.
 "We take pleasure in recommending it."—GARLAND LINCOLN & Co., Worcester, Mass.

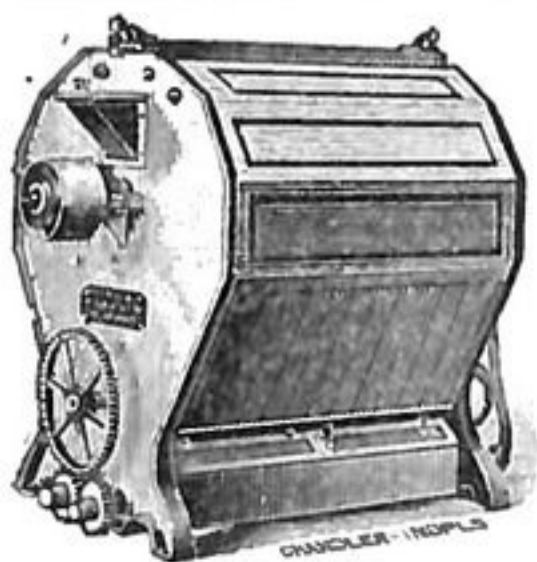
SEND FOR CATALOGUE—ILLUSTRATED AND DESCRIPTIVE.

The Improved National Turbine Water Wheel

The Best for Economy; The Best for Durability; The Best for Power. ONE THOUSAND FIVE HUNDRED NATIONAL WATER WHEELS IN USE Prove that our Assertions are Supported by the Leading Manufacturers in the Country. Send for illustrated catalogue and prices to the manufacturers.

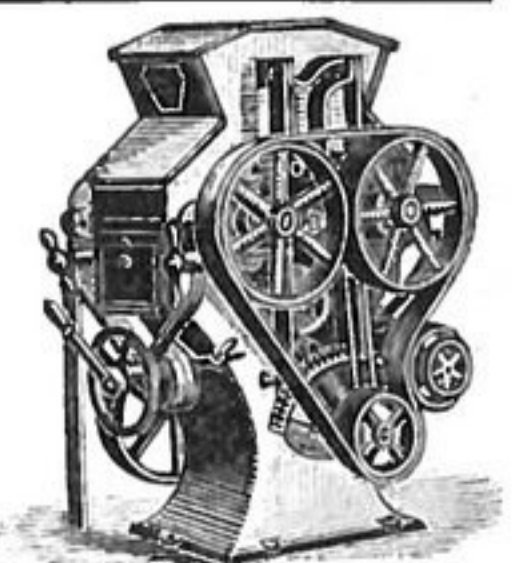


The Case Wheel & Mill Co., Bristol, Conn.



FOOD FOR REFLECTION

READ IT, AND DON'T FORGET IT

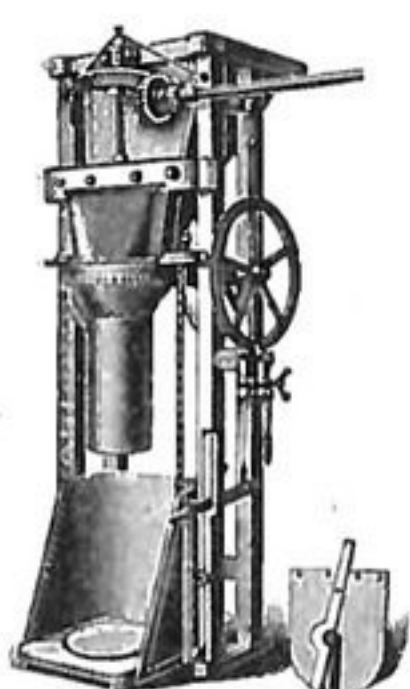


A Convincing Testimonial.

The following letter was written by a prominent Indiana firm of winter wheat millers and published in one of the milling journals. It will explain itself:

"Seeing articles from time to time in the milling journals in regard to different mills, we would be pleased to furnish you with a short description of ours. Our mill was furnished and put up by the J. B. Allfree Co., of Indianapolis, Ind., and has been in operation since July, 1888. We have 75 barrels capacity, making three breaks on wheat and five on middlings. The rolls are known as the 'Keystone' and are very fine machines, as they are well built, have excellent adjustments and are supplied with an automatic feed which is perfection in itself, making in all light-running and very complete machines. The bolters are called the 'Success' and are built by the same company. This reel has advantages over any round reel we have seen. The lift-ers are so arranged that by the use of a lever they can be adjusted in or out, thus allowing the miller to confine or discharge the stock, according to his own judgment and the kind of stock being handled. The purifiers, bran-duster and packer are alike good machines and the workmanship is first-class in every respect. The wood-work, being finished with two coats of var-nish, gives the mill a very fine appearance. The plant from the start has made an excellent grade of flour and we have had no trouble in competing or selling all we can make. There has not been a single change made, nor do we desire one. The clean-up is first-class and we think we have one of the finest little mills in the state. We give a standing invitation to any of our brother millers to visit our mill and examine its work. The string hangs on the outside and all are welcome. In dealing with the Allfree Co., we find them perfect gentlemen in every respect, and, while filling the contract in all particulars, they even did more than they agreed to. Wishing them deserved success we are respectfully,

EMMONS & LEHMAN,
Jamestown, Ind., Jan. 10.

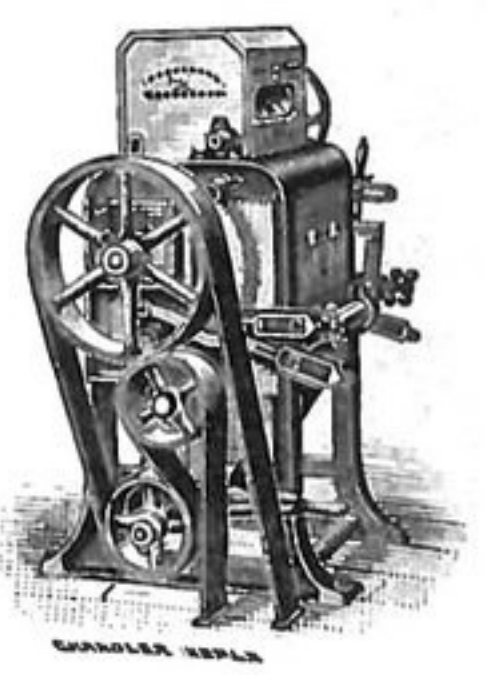


WHEN YOU WANT TO BUILD AN A NO. 1 MILL.

We Solicit Orders for Dufour Bolting Cloth.

—ADDRESS—

The J. B. Allfree Co., Indianapolis, Ind.



RIGHT TO THE POINT

"The best laid plans o' mice and men
Gang aft a'glea."
But the Case Mill gets there every time,
So all the millers say.



"WE PUT IN A CASE SHORT SYSTEM MILL."

Old father Wise, with twinkling eyes,
Points backward to the well-filled till,
While Thrifty scans the new made plans
To double up the CASE SHORT MILL.



"WE DIDN'T!"

Old Shiftless weeps—the sick cat sleeps,
Doolittle has gone out to pray,
The spiders fill the empty till,
While hungry rats now hold full sway.

JUST TAKE A LOOK AT WHAT THIS MAN WRITES:

THE CASE MFG. CO., COLUMBUS, OHIO.

ELYRIA, OHIO, OCT. 10, 1888.

Gentlemen: Enclosed please find settlement in full of my account. The 4-break mill works splendid and am well pleased with it. The Inter-Elevator Flour Dressers are everything you represent, both in capacity and excellence of work. The Special Purifiers are a fine machine and far ahead of the Purifiers you put in my other mill in '83. Am especially pleased with the millwright work. It is well planned and finished in a good, workmanlike manner. I can not praise your millwright and his work too highly.

Yours resp'y,

GARRET REUBLIN.

If you want a successful mill write us. Long System Mills remodeled on short notice. Case Short Break Corrugations put on any make of rolls. Our Roller Corn Mills are a most profitable investment. Now is the time to put one in your mill. Our Aspirator and Purifier for Corn Meal will astonish you. Belting, Gearing, Elevator Supplies, Silk and Wire Cloths shipped promptly on receipt of order. If you want mill supplies of any kind write us. Estimates on mills of any desired capacity furnished on short notice. Write us at once and state the capacity wanted and number of grades of flour you wish to make. The Automatic Feed on our machines makes them superior to all others. Catalogues and Circulars Mailed on Application.

RE-DRESSING ANY MAKE OF ROLLS PROMPTLY A SPECIALTY.

THE CASE MANUFG. CO., COLUMBUS, OHIO.

PLEASE MENTION "THE MILLING WORLD."



VOL. XX. No. 3.

BUFFALO, N. Y., MARCH 18, 1889.

\$1.50 PER YEAR.

FLOURING-MILLS appear to be quite as prone to burn as even the traditional inflammable saw-mill, or planing mill, or furniture factory, or powder mill. The monthly fire record proves that fact, as the contribution of the flouring-mills to the total loss is generally quite as large as that of the wood-working establishments.

SHOULD the millers really make a serious attempt to corner the spring and winter wheat supply, they will surely meet a strong competition in at least two quarters: 1. The grain-brokers and speculators would imitate their attempt. 2. The wheat-growers themselves would be tempted to combine for their own good. Corners, like the smallpox, are contagious.

MEANWHILE, neighbors, millers, friends and esteemed contemporaries, do not forget the Millers' National Association. It will soon be time to give it another "rassle" in free advertising for the perfunctory jollification at Milwaukee. Secretary Seamans will probably be on hand in June with the Association in his pocket. It may smell of camphor-gum when he unwraps the tissue-paper from it, but it will doubtless exhibit all the marks of perfect embalming and fossilization.

RUMORS of patent suits against certain users of milling-machines begin to circulate again. Every owner of a good machine with a perfect patent title is entitled to recompense for that machine, and he should have it. Every claim made for royalty on any machine whose patent title is not perfectly clear should be contested to the last. The patent shark is an unpleasant animal, but the genuine inventor of a valuable machine has a right to full reward for his genius. Squelch the shark and pay the true inventor.

WHERE is that Scandinavian Elevator Company, incorporated in Minnesota, with a British capital of \$5,000,000 or \$20,000,000, which was to buy and store quantities of No. 1 hard northwestern to ship unadulterated and unsophisticated to the British mills direct? It is long since "its name has been in the papers." Where is it? Has it gone to meet the Manitoba 15,000,000 bushels of wheat from the crop of 1888? Or is it waiting in nascent condition for the 20,000,000-bushel Manitoba crop of 1889, which the boomers are harvesting before it is sowed? Or has it emigrated to Australia to garner the "great crop" of 3 bushels to the acre in that country? Or have the British millers decided that it is better to let the skillful Yankee millers grind the Yankee grain into fine Yankee flour, and then import the fine Yankee flour to mix with the fluff which the British millers make from their nasty Indian and other inferior wheats? What has interjaculaled the Scandinavian Elevator Company into obliterative defunctitudinousness?

RATHER interesting to every man connected with the milling industry is the statement concerning a roller-mill lawsuit in Europe reprinted in another column of this issue. Assuming that the Neenah "Gazette," from which that statement is taken, has been correctly informed, and that the roller-mill in question is really either a German or Austrian

invention, it becomes a most suggestive question to inquire how many other so-called American roller-mills may be copies of antedating European inventions. Investigation might reveal some very interesting points on this question. Can it be possible that the roller-mill alluded to in the article is one of the eighty or more alleged patents owned and controlled by the Consolidated Roller Mill Company? If there were in existence a "national association" worth a pinch of snuff, the millers of the United States would not be left in partial darkness on the highly important point of the validity of the patents on the machines they use in their mills. Before any royalties are paid by any millers or any mill-builders, on any machines in general use among the millers of this and other countries, to any firm or combination of firms claiming to own or control the alleged patents on those machines, ordinary business prudence would suggest settling first of all the validity of those patents. Possibly other machines beside the well-known one mentioned may have patented prototypes abroad.

REFERRING to President Harrison's protectionist ideas, our esteemed Canadian cotemporary, the Toronto "Monetary Times," says: "The most numerous class of workers are those found on the farm, and for their surplus produce there is no protection; they are obliged to meet in the open markets of the world the competition of all nations which produce an excess of breadstuffs for exportation." Now what does our cotemporary mean by that assertion? Where has it learned that our farmers have no protection for their surplus produce? The American farmer's bacon, ham and lard are protected by a duty of 2 cents a pound; his beef and pork 1 cent a pound; meat extracts 20 per cent.; butter and substitutes and cheese 4 cents a pound; milk 20 per cent.; currants 1 cent a pound; nuts 3 cents a pound; preserved fruits 20 per cent.; grapes and limes 20 per cent.; hops 8 cents a pound; jellies, sweetmeats and fruits preserved in sugar or molasses 35 per cent.; lemons \$2 per thousand; oranges \$1.60 per thousand; peanuts 1 cent a pound; potatoes 15 cents a bushel; dried plums 1 cent a pound; raisins 2 cents a pound; mustard 10 cents a pound; pickles 35 per cent.; vegetables in salt or brine 10 per cent.; vinegar 7½ cents a gallon; barley, Indian corn, corn-meal, oats, peas and rye 10 cents a bushel; patent barley 20 per cent.; pearled or hulled barley 1 cent a pound; malt 20 cents per bushel of 34 pounds; garden seeds and bulbs 20 per cent.; linseed or flaxseed 20 cents a bushel; oatmeal ½ cent a pound; rice uncleaned 2½ cents a pound; split peas 10 cents a bushel; starch 2 and 2½ cents a pound; wheat 20 cents a bushel; wheat flour 20 per cent.; leaf tobacco 75 cents a pound; cider 20 per cent.; wine \$3.50 a dozen for pint bottles and proportionately; sugar 1.4 cents a pound; honey 20 cents a gallon; cotton in different forms from 10 to 50 per cent.; flax 35 per cent.; wool from 10 to 40 per cent.; flowers and grass 10 to 20 per cent.; hay \$2 a ton; straw 20 to 30 per cent.; wood from 10 to 30 per cent.; cattle, horses and sheep 20 per cent. If those figures, taken from the official records, do not show protection for the American farmer, will our Canadian neighboring courteously explain what they do mean?

The Canton Cabinet Filing Case Company, Canton, Ohio,

MANUFACTURERS OF

The New Buckeye Document Case & Letter File; Also All Kinds Office Furniture



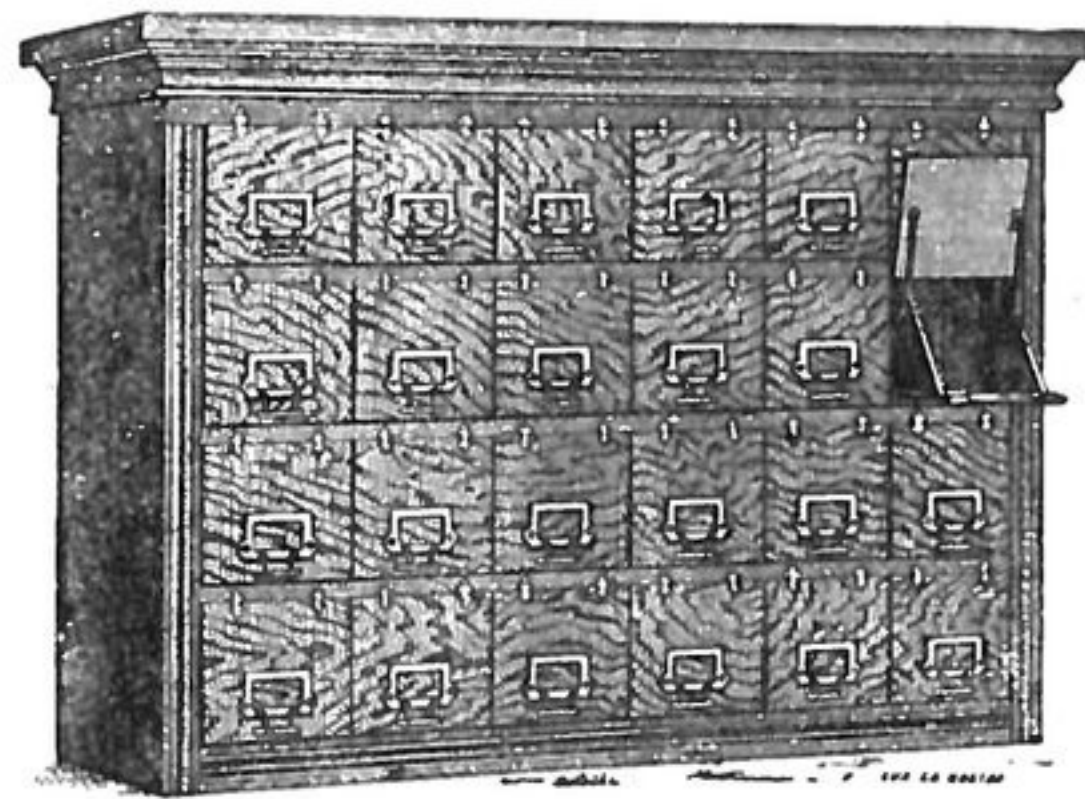
NO. 8.

NO. 8 Represents one side of one of our Revolving Cabinet Letter Files and Document Cases Combined. It contains 30 Document Drawers and 8 Letter File Drawers. In filing letters we use first VOWEL of name on front of drawer, and LETTER FOLLOWING first VOWEL on Index Sheet within drawer. We also make more exhaustive systems which contain from 6 to 100 or more Filing Drawers.

NO. 1 Represents one of our small Document Cabinets, for use on desks or brackets. Action of drawer can be seen in the cut. When front is raised inner drawer comes forward, exposing contents of drawer for inspection.

Our Cabinet Files are Conceded to be the Most Convenient of Any in the Market. They are Compact, Simple, Complete, Durable and Ornamental.

SEND FOR PRICE LIST AND CATALOGUE.



NO. 1.

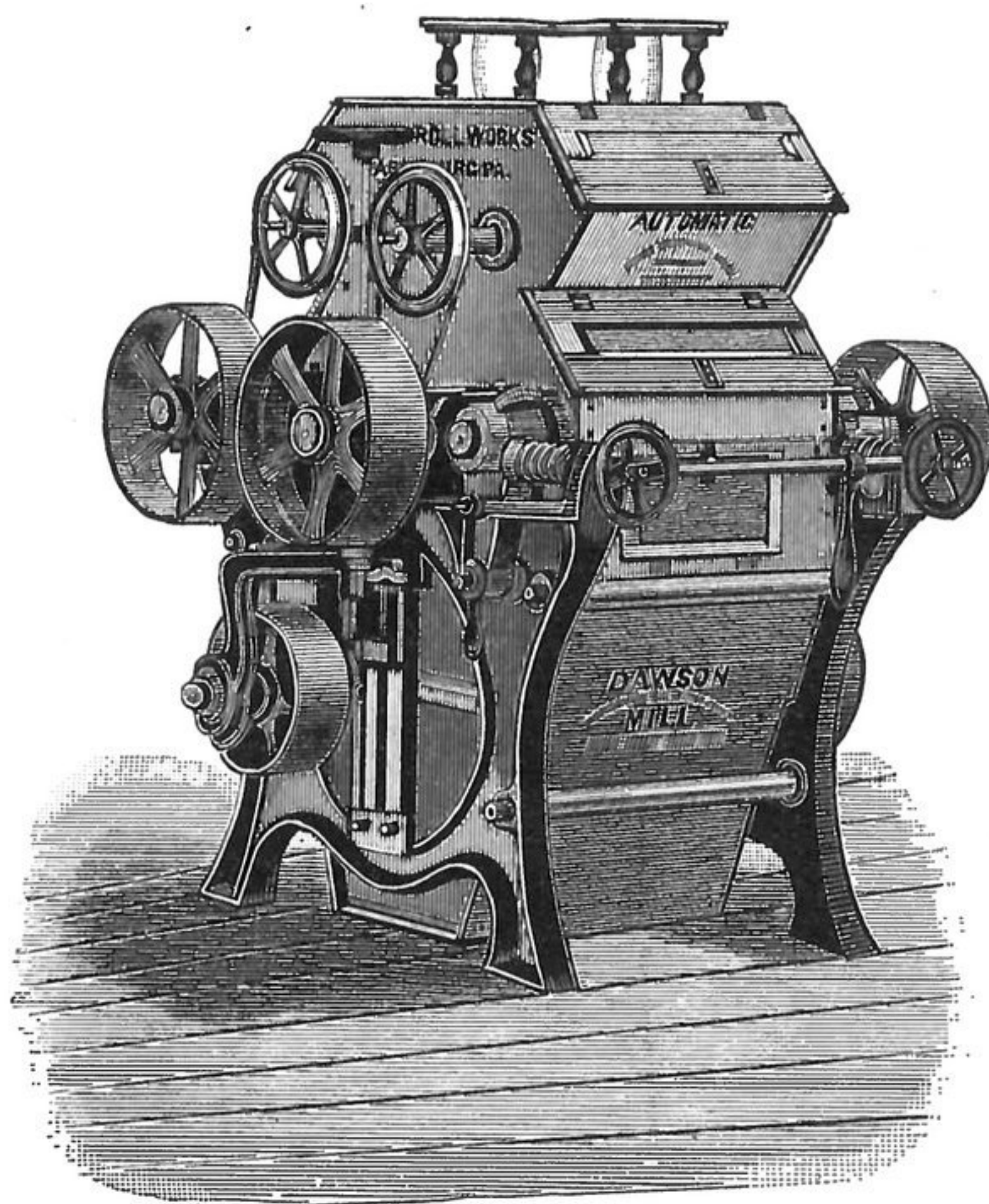
Dawson's Roller Mill

Is acknowledged to be the very best in the market. It has our Patent Automatic Centrifugal feeder, never failing to feed the stock the full length of rolls in an even sheet. It is the Latest and Best feed out, uses less power and is simple in construction. It can be placed on any style of machine with little expense. We use for roll bearings phosphor-bronze metal which will admit rolls being run at any speed without heating and with little friction, and uses little oil. We use the Dawson Corrugation, which is admitted the best in long or short system mills as the action is granulating rather than CUTTING.

We have a large plant to Re-grind and Re-Corrugate Rolls.

Owing to our late increased facilities and central location we are enabled to ship goods promptly on the shortest notice.

PARTIES CONTEMPLATING REMODELING THEIR MILLS OR BUYING ANY ROLLER MACHINES ARE REQUESTED TO PUT THEMSELVES IN CORRESPONDENCE WITH US.



FOR PRICE LISTS AND CIRCULARS, ADDRESS,

Dawson Roll Works, Harrisburg, Pa.

C. H. BIRD & CO., KALAMAZOO, MICH.

MANUFACTURERS OF PATENT

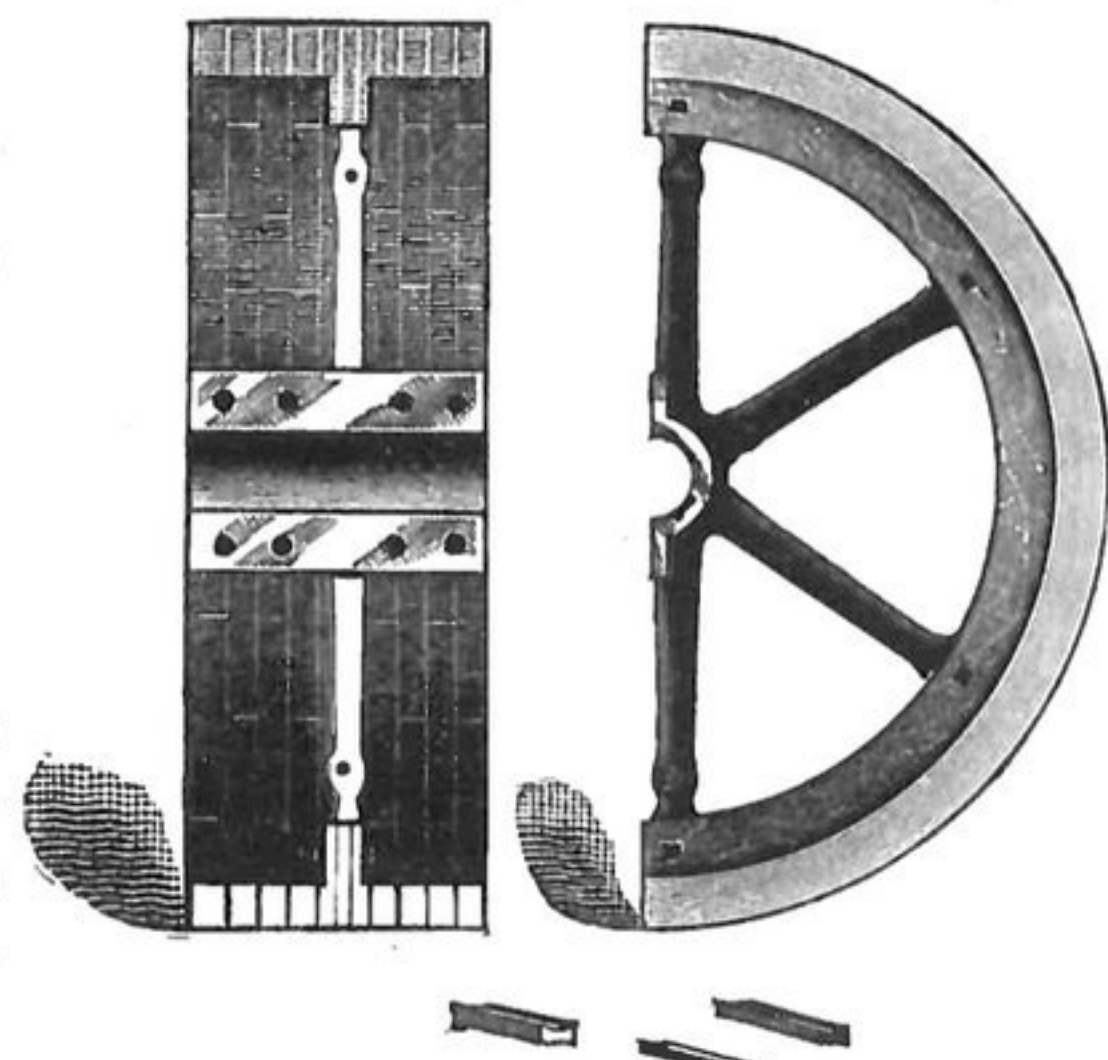
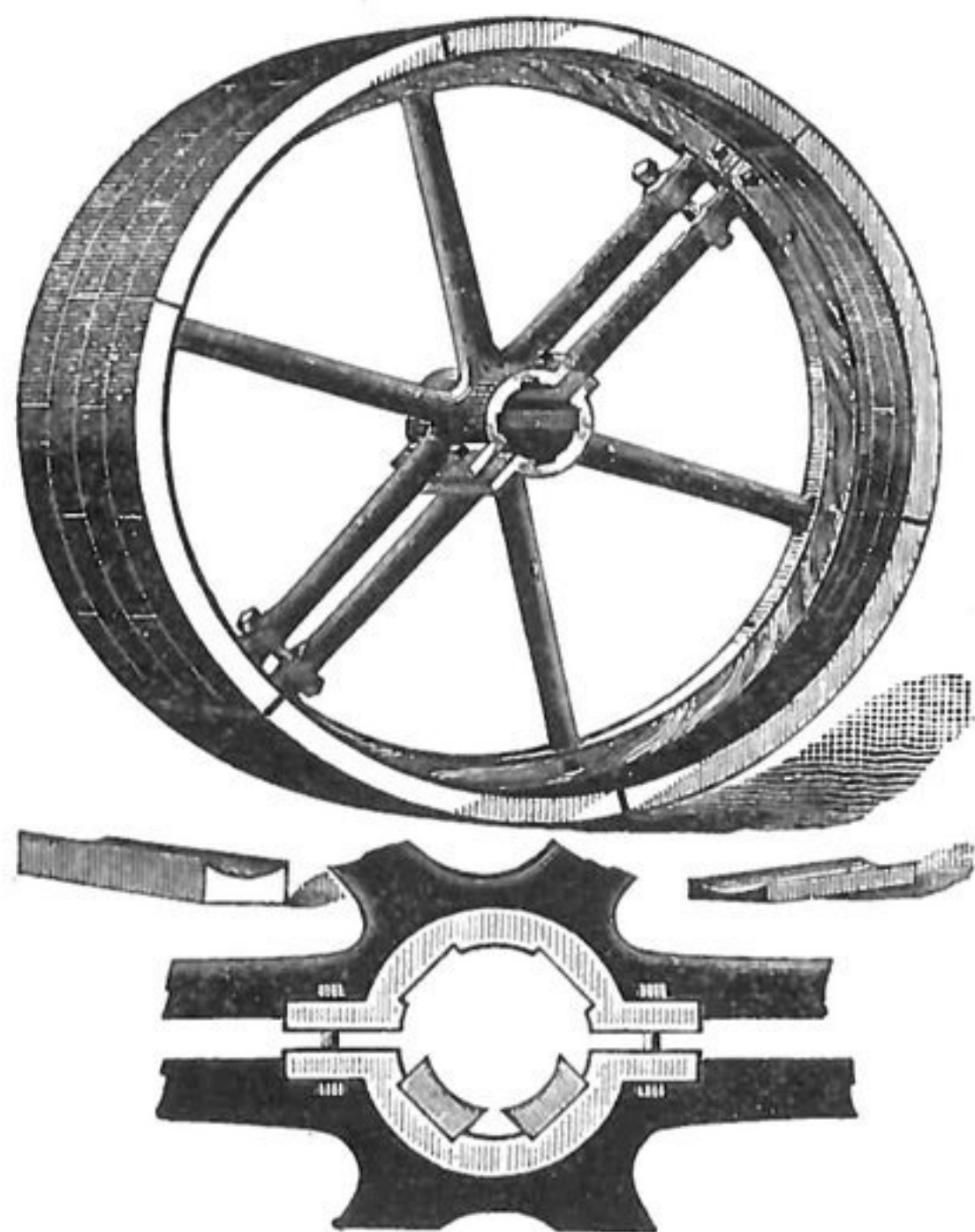
Wood Split Pulleys

WOOD RIM WITH IRON ARMS.

The Best Pulley on Earth!

Is very easily and quickly adjusted to Shaft. Has Patent Iron Bushings Interchangeable, to Fit Different Diameters of Shafts. Has FOUR or SIX Bearings on Shaft. This fastening never slips. Every Pulley strongly built and perfectly balanced.

SEND FOR CATALOGUE AND PRICE LIST.





PUBLISHED EVERY MONDAY. OFFICES: { Corner Pearl and Seneca Streets,
Over Bank of Attica.
McFAUL & NOLAN, - - - PROPRIETORS.
THOMAS MC FAUL. JAMES NOLAN.

SUBSCRIPTION.

In the United States and Canada, postage prepaid, \$1.50 Per Year, in advance; remit by Postal Order, Registered Letter, or New York Exchange. Currency in un-registered letter at sender's risk.
To all Foreign Countries embraced in the General Postal Union, \$2.25 Per Year, in advance.
Subscribers can have the mailing address of their paper changed as often as they desire. Send both old and new addresses. Those who fail to receive their papers promptly will please notify at once.

ADVERTISING.

Rates for ordinary advertising made known on application.
Advertisements of Mills for Sale or to Rent; Partners, Help or Situation Wanted, or of a similar character One cent per word each insertion, or where four consecutive insertions are ordered at once, the charge will be Three cents per word. No advertisement taken for less than 25 cents. Cash must accompany all orders for advertisements of this class.
Orders for new advertisements should reach this office on Friday morning, to insure immediate insertion. Changes for current advertisements should be sent so as to reach this office on Saturday morning.

EDITOR'S ANNOUNCEMENTS.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trades.
Correspondents must give their full name and address, not necessarily for publication, but as a guarantee of good faith.
This paper has no connection with a millfurnishing house and aims to represent the trade without prejudice, fear or favor.
Address all communications

THE MILLING WORLD,
BUFFALO, N. Y.

Entered at the Post Office, at Buffalo, N. Y., as mail matter of second-class.

SITUATIONS WANTED.

Advertisements under this head, 25 cents each insertion for 25 words, and 1 cent for each additional word. Cash with order.
Four consecutive insertions will be given for the price of three.

WANTED.

Situation by a miller of 10 years' experience. Thirty-one years of age. Married. Can give best of reference. Address, ANDREW YOUNG, Box 82, Mayville, N. Y. 25

WANTED.

A situation in a mill, by a married man of steady habits; 34 years old; no children; had three years' experience in a custom mill; can furnish best of reference. Address, CHAS. BETTIS, Forestville, N. Y. 24tf

SPECIAL ADVERTISEMENTS.

Advertisements of Mills for Sale or Rent, Partners Wanted, Machines for Sale or Exchange, etc., etc., cost 1 cent per word, for one insertion, or 3 cents per word for four insertions. No order taken for less than 25 cents for one insertion, or 50 cents for four insertions. Cash must accompany the order. When replies are ordered sent care of this office, 10 cents must be added to pay postage.

MILLSTONES FOR SALE CHEAP

Complete run of millstones, curb, spindle, hopper, etc. GARDNER MORSE, Eaton, Madison county, N. Y. 16

FOR SALE.

Three-run mill, repaired, and a first-rate dwelling house, built last summer. I don't owe one dollar, but will sell cheap for cash, to build a mill in Forest county. Address J. S. PORTER, Lamartine, Clarion county, Pa. 2225

MILL PROPERTY FOR SALE.

In Central New York, on reasonable terms and easy payments. For particulars address B, care of THE MILLING WORLD, Buffalo, N. Y. 14

FOR SALE.

10 Single Sets 9x30 Stevens Rolls.
2 Single Sets 7x12 Ferriers Rolls.
2 Centrifugal Reels.
2 No. 8 Niagara Bran Dusters.
2 No. 8 Prinz Dust Collectors.
1 No. 4 Hunter Purifier.
1 No. 6 Garden City Purifier.
1 No. 1 Pyne Purifier.
1 No. 8 Richmond Brush Machine.
1 No. 2 Silver Creek Scourer.
1 No. 00 Becker Brush Machine, over 50 Run Millstones all sizes, all complete.
Above Machines are in first-class condition and practically as good as new. Address J. B. DUTTON, 115 E. Fort Street, Detroit. 18tf



If you are desirous of obtaining the best Mill or Cob Crusher, send for our catalogue and be convinced that our's fill the bill. Can not fail to please you. They are guaranteed to prove as represented.

C. C. PHILLIPS,
OFFICE, 20 SOUTH BROAD STREET,
PHILADELPHIA, PA.

MILL MACHINERY FOR SALE.

One 24-Inch Portable Mill, wood frame, capacity 15 to 20 bushels per hour; new, best make.
One 20-Inch Portable Mill, iron frame, capacity 12 to 16 bushels per hour; new, best make.
One No. 0 Standard Combined Separator, Smutter and Brush Machine; new, best make.
One 18-Inch Vertical Portable Mill, French Buhr Stone, hung on horizontal shaft; capacity 25 to 40 bushels per hour; new, best make.
One 14-Inch Vertical Feed Mill; best make, new, a bargain.
One No. 6 Dustless Separator; new, a bargain.
Two No. 4 Scientific Grinding Mills, capacity 40 to 50 bushels per hour; new.
A Lot of Elevator Buckets, brand new, best make, any size desired, very cheap.
One No. 1 Full Rigged Combined Dustless Separator; new, a bargain.
Four Corn Cob Crushers, right or left hand, driven from above or below, best make; capacity 40 to 60 bushels per hour.
For particulars address, FRANK SMITH, care of THE MILLING WORLD, Buffalo, N. Y. 5tf

ACCORDING to recent reports the Canadian government has refused to increase the duty on imported wheat flour. The millers made out a strong case, but the powers-that-be considered it inexpedient to protect the Canadian millers against American competition.

NOT all the tricks in trade are Yankee tricks. One Englishman has just been snaked over the coals for painting ordinary English sparrows yellow and selling them for canary birds. Another Englishman, John Matthews, has just been fined \$25 with \$55 costs for "doctoring" old clover seed with sulphur fumes and selling it for new seed. Where are Connecticut shoe-peg oats and wooden nutmegs in comparison with these two dizzy frauds?

WINTER-WHEAT millers are said to be working secretly to get control of the supply of winter wheat. Recent reports from St. Louis indicate that they have done some work in that direction. Spring-wheat millers are popularly believed to be doing the same thing with the spring wheat. Should two powerful associations arise, one controlling the supply of spring wheat and the other the supply of winter wheat in the United States, the milling situation will be at once radically changed. In that event the large mills would be in a position to crush out the small mills in both sections. We have always maintained that the real way to set about controlling the output of flour is to secure control of the grain supply, and that idea seems to be in the way of adoption by the flour-makers who are engineering the associations. It is not, of course, certain that the control of the grain supply and the flour output by the large mills will be an unmixed good for the public. Certainly it would mean death to the thousands of smaller mills throughout the country that are forced to draw their wheat from the supplies which the associations are said to be trying to control. The entire milling interest of the country would be revolutionized, mill-builders, mill-furnishers and consumers suffering equally with the smaller millers in the change. There is a possibility that the associations might be able to corner the wheat supply of the country, under ordinary circumstances, but there is always one factor that would stand in the way of a successful corner, and that factor is the uncertainty of the crop. A serious shortage might push up prices so that control would be impossible. A large surplus might depress prices so that control would be undesirable. We believe that even Minneapolis and St. Louis, with all outlying contributory interests, would find it a stupendous bargain to attempt the control of a crop that ranges from 416,000,000 bushels to 512,000,000 bushels. Even with two great associations controlling the spring and winter wheat absolutely, a third to control the Pacific Coast wheat would still be necessary to complete the corner. Missionary work, long and earnest, will be needed to induce the Pacific wheat-growers to combine in such a tripartite corner. It has always been a doctrine of the central spring and winter wheat-growers that the Pacific grain was not worthy of consideration in competition with their own, and the Pacific growers will not be slow to rush in wherever and whenever they see a chance to poach on the preserves of the central growers. The great capacity of California, Oregon, Washington and Idaho will soon materialize under the rush of immigration, and it is safe to say that any calculation which omits the Pacific coast in the formation of a combine to control the supply of wheat will have one fatally weak spot. The men who are dreaming of a corner in wheat must not forget the immutable laws of supply and demand.

CORROSION AROUND STAY-BOLTS.

"The Locomotive."

Around the stay-bolts of water-legs or furnaces curious grooves are often found in the plates, radiating from the bolts as centers. This kind of corrosion is well illustrated in Fig. 1, which shows the water side of a piece of metal recently cut from a fire-box subjected to considerable strain. The plate undoubtedly bent backward and forward slightly under the varying pressures, and though the flexure and consequent alteration of the surface were probably too small to be seen, it is easy to believe that it was sufficient to open up the fibers to the water in certain directions, rather than in certain others. Judging from the appearance of the plate, it seems likely, also, that in tapping out the holes for the stay-bolts strains were brought to bear on the plate, which disturbed the skin of the iron and afterwards hastened the corrosion. The effects of apparently unimportant strains are often much greater than one who has not studied them would readily believe. We have already shown that surface markings on iron plates may often be reproduced with considerable distinctness by simple immersion in acid, even after they have been planed off and the metal polished until its surface appears to be perfectly uniform. In the case illustrated in Fig. 1, the boiler often lay idle for a considerable time, and the water that was used was rather impure, so that the action was naturally more rapid than it would be under less favorable circumstances; but the same thing takes place with the purest water, provided there is sufficient strain upon the bolts to disturb the arrangement of the surface particles. In cases of this kind there is no external evidence of the condition of things inside, for the exterior looks perfectly sound. Fig. 2 represents a portion of the inner plate of a water-leg of a locomotive boiler. The furrows in this case were quite deep and looked as though they had been cut by a tool, and the stay-bolts had been corroded entirely off at the outer ends.

SECTIONAL OR TUBULOUS BOILERS.

Referring to the sectional or tubulous variety of boilers, which have come into favor for stationary engines during the past twenty-five years, our cotemporary, "The Safety Valve," says: Generally these boilers consist of a collection of wrought-iron tubes connected with one another variously and placed in vertical, inclined or horizontal rows over and around a grate, and inclosed in walls, generally of masonry, in such a manner as to prevent radiation as much as possible. These tubes are usually connected with an upper and lower water body, the upper one serving also for the steam-

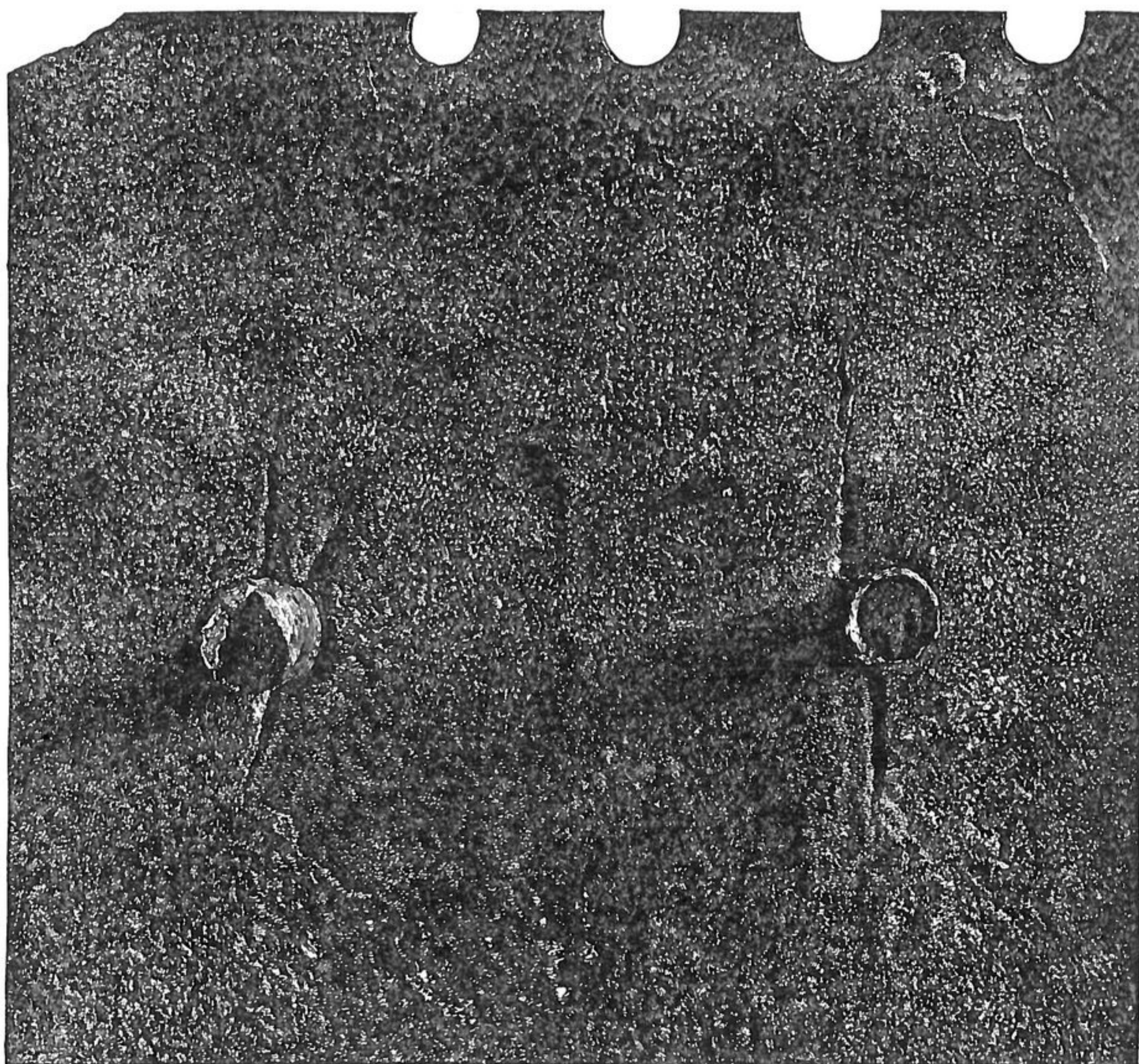
room. In some arrangements the tubes are either siphon-shaped or bent into a coil. The following are some of the principal advantages claimed for these boilers: 1. The small diameter of the tubes of which they are composed renders them much stronger than ordinary boilers. 2. They are safer; for even in case some of the tubes should burst, no violent explosion can ensue, because the fractured parts present a comparatively small opening, and the quantity of water contained in this type of boiler is small in proportion to the power. 3. They can be cheaply built and easily re-

paired, as duplicate pieces can be kept on hand. The various parts of a boiler can be transported without great expense, trouble or delay; the form and proportions of a boiler can be suited to any available space; and the power can be increased by simply adding more rows of tubes and increasing the grate area. 4. Their evaporative efficiency can be made equal to that of other boilers, and, in fact, for equal proportions of heating and grate surfaces, it is often a trifle higher.

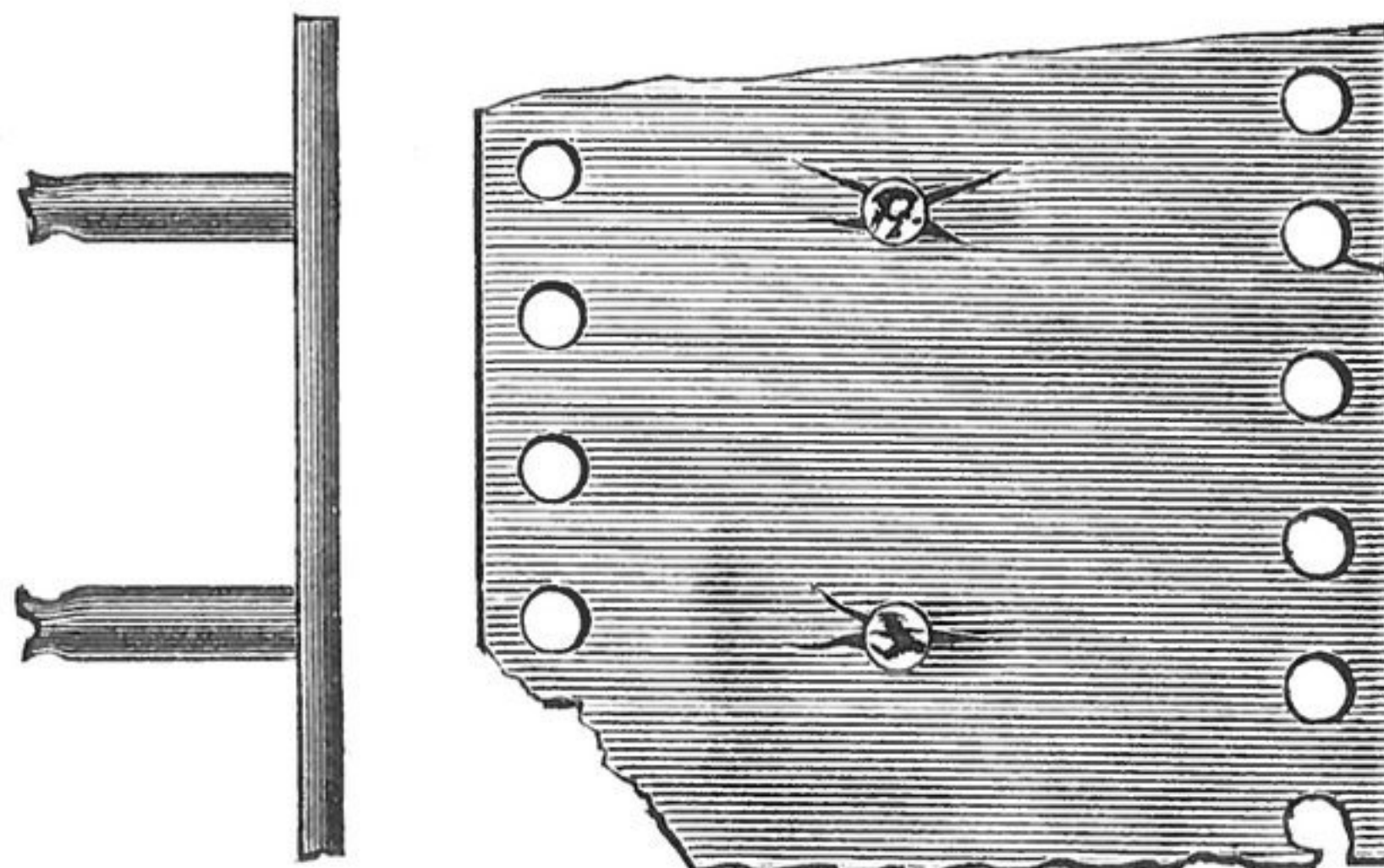
Now let us examine the known disadvantages of these boilers: 1. They generally occupy more space and require more masonry

than ordinary boilers. 2. On account of the small quantity of water which they contain, sudden fluctuations of pressure are caused by any irregularities in supplying the feed-water or handling the fires, and the rapid and at times violent generation of steam causes it to accumulate in the contracted water-chambers and leads to priming, with a consequent loss of water, and to overheated tubes. The horizontal or inclined water-tubes which mainly compose these boilers do

not afford a ready outlet for the steam generated in them. The steam bubbles can not follow their natural tendency and rise directly, but are generally obliged by friction to traverse the tube slowly, and at times the accumulation of steam at the heated surfaces causes the tubes to be split or burned. 4. The use of water which forms deposits of solid matter still further increases the liability to overheating of the tubes. It has been claimed by some inventors that the rapid circulation of the water through the tubes would prevent any deposit of scale or sediment in them, but experience has proved this to be a grave error. Others have said that the expansion of the tube would detach the scale as fast as it was deposited and prevent any dangerous accumulation, but this also has been proved a falsity. Again, the use of cast-iron about these boilers is a constant source of trouble from cracks. The above statements are true of the tubulous boilers as a class, but, as there are exceptions to all rules, so there are boilers which belong to this type that are notably free from the above mentioned defects.



CORROSION AROUND STAY BOLTS.—FIG. 1.



CORROSION AROUND STAY BOLTS.—FIG. 2.

ALLEGED ENGLISH MILLING POETRY.

JOHNNY, OBTAIN YOUR FIREARM!

DIS-SIMILAR.

My hair is white, but not with years,
Nor grew it white
In a single night,
As men's have grown from sudden fears!

BYRON.

My head is white and so's my beard,
And both changed so
A while ago

Whilst six centrifugals I cleared!

"Whang," in London Miller.

AN ASPIRATOR.

H

We hear of inventions at home and abroad,
All the outcome of genius latent,
Each having its day and then fading away,
Being ousted by some novel patent.

But the "Aspirator" depicted above,
Though abused by many a nation,
Still holds its own and will ne'er be thrown
On one side for a new complication.

Can the engineer, either British or Scotch,
This old aspirator demolish?

No! the roller-mill's feed shall "run to seed"
Before ever its use we abolish.

"Lemnos," in London Miller.

"KICK."

When of milling quacks we're sick,
Then we take to reading Kick;
Sleep, with other books, comes quick,
But we're wide awake o'er Kick!

One may study, till a crick
Warps his neck, the points of Kick;
It is wise to waste the wick
Till next morning over Kick.

German gems are littered thick
Over every page of Kick;

Ev'rything is straight and slick
And arranged aright in Kick;
Ev'ry sham and dodge and trick
Is reduced and scalped by Kick.

Full of fine things, as a tick
Is of feathers, is great Kick;

In the brain ideas stick
That are culled from fruitful Kick;

But 'tis hard to choose and pick,
There's so much well served in Kick.

Oh, a veritable rick
Of sound, seasoned grain is Kick!

There's no milling work can lick
Or at all compare with Kick;

He, indeed, must be a "brick"
Who will soar as high as Kick.

Homer's first in the e-pic

Art—in milling matters Kick.

Shakespeare's first in drama—tic

Writing, and in milling Kick.

Moore is chief in the ly-ric

School, in dusty matters Kick.

Donald, David, John and Mick,

Via Powles, swallow Kick;

Ev'ry dusty liege of "Vic"

Is a subject, too, of Kick!

So fill, Harry, Tom and Dick,

And quaff deep to Doctor Kick.

May Fame at her topmost nick

Trace in gold the name of Kick;

Come, once more our goblets click,

And drain once again to Kick!

"Whang," in London Millers' Gazette.

POINTS IN MILLING.

OWNERS of small mills in some localities begin to inquire what effect upon their business the proposed control of the wheat supplies by the large millers will have. Naturally, if the large millers could really control the wheat crop of the country, they would probably sit down hard on the thousands of small millers who draw their supplies of grain from the same sources. They do not yet control the wheat crop, however, and there are several very good reasons for believing that they will not soon be able to control it. In the

first place, there is too much of the crop for easy control. It would require nearly \$400,000,000 capital to control it. In the second place, if the large millers combine to control, the small millers will combine to compete, and the farmers would sell to the syndicate that offered the largest price. Again, the gamblers and the legitimate brokers and handlers of grain would hardly find it to their interest to hand the grain supply over to the large millers. Their influence may be unwholesome, but it is powerful, and it can not be omitted from the calculation of probabilities and possibilities in connection with the wheat crop. Again, the small millers, blocked out from the markets supplied by the great wheat-growing sections, would make a call upon the farmers in their immediate vicinities, and thousands of those farmers, now growing little or no grain, would turn their land to wheat, thus adding largely to the total supply and enabling the small miller to go on grinding. Financial difficulties would be the most powerful of all deterrents. An organized millers' syndicate, once in existence and operation, would be compelled to take all the wheat offered to it from the time the harvest began. Enormous amounts of ready money would be necessary to maintain absolute control, and only absolute control would be profitable to the syndicate. It is not easy to see that the small miller, who has survived the predicted disaster of the change from buhrs to rolls, is in as much danger from the proposed wheat corner by the large millers as he was in from that change. He will always be able to find grain to grind, and if he always grinds it well he will always be able to find a market for his flour.

THE elevator was invented by Oliver Evans a century ago, and from his day to ours its speed has been a subject of discussion among millers. The general speed is for 6-inch pulley 125 revolutions per minute; a 22-inch pulley 180; and a 20-inch pulley 250 revolutions per minute. The outer edge of the cup travels faster than the pulley in passing over it, and a greater speed especially in the case of larger pulleys will throw the grain from the head and catch it in the points of the cups. The following table of speeds will be found to be nearly correct in practice, but the speed can be increased or reduced to suit, this table being a fair average:

| Size Pulley, Ins. | No. Revolutions. | Size Pulley, Ins. | No. Revolutions. | Size Pulley, Ins. | No. Revolutions. | Size Pulley, Ins. | No. Revolutions. |
|-------------------|------------------|-------------------|------------------|-------------------|------------------|-------------------|------------------|
| 6 | 75 | 17 | 46 | 28 | 31 | 39 | 26 |
| 7 | 73 | 18 | 44 | 29 | 30 | 40 | 25 |
| 8 | 69 | 19 | 41 | 30 | 29 | 41 | 25 |
| 9 | 65 | 20 | 39 | 31 | 28 | 42 | 25 |
| 10 | 63 | 21 | 38 | 32 | 27 | 43 | 25 |
| 11 | 59 | 22 | 37 | 33 | 26 | 44 | 25 |
| 12 | 56 | 23 | 36 | 34 | 26 | 46 | 24 |
| 13 | 52 | 24 | 34 | 35 | 26 | 45 | 23 |
| 14 | 50 | 25 | 34 | 36 | 26 | 47 | 22 |
| 15 | 49 | 26 | 33 | 37 | 26 | 48 | 21 |
| 16 | 47 | 27 | 32 | 38 | 26 | | |

This speed can be varied 10 to 15 per cent. either way, as may be necessary through any change of motion of machinery, and as a fair average it will be found to give general satisfaction.

"MYSTERIOUS fires" in mills continue to be reported. But are they really "mysterious"? One who examines chemically a kernel of any kind of grain or cereal, will find hidden about the germ variable quantities of a highly-combustible gas, that will take fire at a temperature slightly above the boiling point of water; hence if he happen to be grinding grain in a poorly-ventilated building, the journals, belts, and boxes all working together in generating heat, the gases being accumulated rapidly by the rollers or stones crushing the grain, the finely subdivided woody fiber floating in close proximity, is it any wonder that the low heat required to ignite the gases could be easily communicated to the fine dust, and finally the entire building be in flames? The great wonder is that these fires are so few. In addition to this, mill fires are the hardest to manage and subdue of any, for the reason that in every nook and corner the gases are present; hence, fuel of the best possible variety is constantly being added, and it is said the fire was beyond control when

discovered, when it might have been said with equal propriety that it was beyond control the instant it was started. Inasmuch as it has been practically demonstrated that, with the condition of things indicated, the entire building might be submerged in water for an instant and the fire would not be subdued, for it must be remembered that these gases from grain, unlike many others, have not the least affinity for water; hence, water merely adds fuel to the flame by distributing fire among the tinder.

KEEPING quality in flour is sure to be lessened by any and every unnecessary manipulation of the grain in making the flour. Heating, steaming, baking and cooking the grain while grinding may be depended upon to injure the flour in keeping quality. Heating, in particular, will set up fermentation. Moisture will do the same thing. Avoid all unnecessary treatment in this line. The best flour in the world is made in mills in which the practice of cooking the grain is entirely unknown. The best grain in the world will make very poor flour if cooked in the processes of flour-making.

EXPERIMENTS have shown that if corn is thoroughly dried in the fall by kiln-drying or hanging in a dry atmosphere with a temperature of 90° to 120°, and kept dry, it will endure the severest cold without injury to its vitality. So important is dryness to safe-keeping of seed-corn that we must secure that rather than warmth. Corn will stand when dry a heat of 206°, but if not dry its germinative power will be injured at 120°. So corn that is not free from moisture is liable to injury both by heat and cold.

CORN-MILLERS are complaining of the quality of the corn grown last year quite as much as the wheat-millers complain of the quality of the wheat. Both wheat and corn millers are learning many things about flour and corn-meal making which they never knew before. American millers generally have only the best of grain to grind, but the last crop gave them some that was not of the best.

In planning for the transmission of your power in your mill, remember that a belt traveling 800 feet per minute will safely transmit one horse-power for each inch of width, if the pulleys are both the same diameter and the belt laps over one-half of each; but if the belt laps on but one-quarter of either pulley's circumference, then it would have to travel 1,230 feet per minute to transmit a horse-power for each inch of width.

THE "SUCCESS" BOLTER AND DRESSER.

Among the many improved appliances for bolting, high rank must be given to the "Success" bolter and dresser manufactured by The J. B. Allfree Company, the well-known milling machinery makers of Indianapolis, Indiana. This machine is represented in the accompanying engravings,

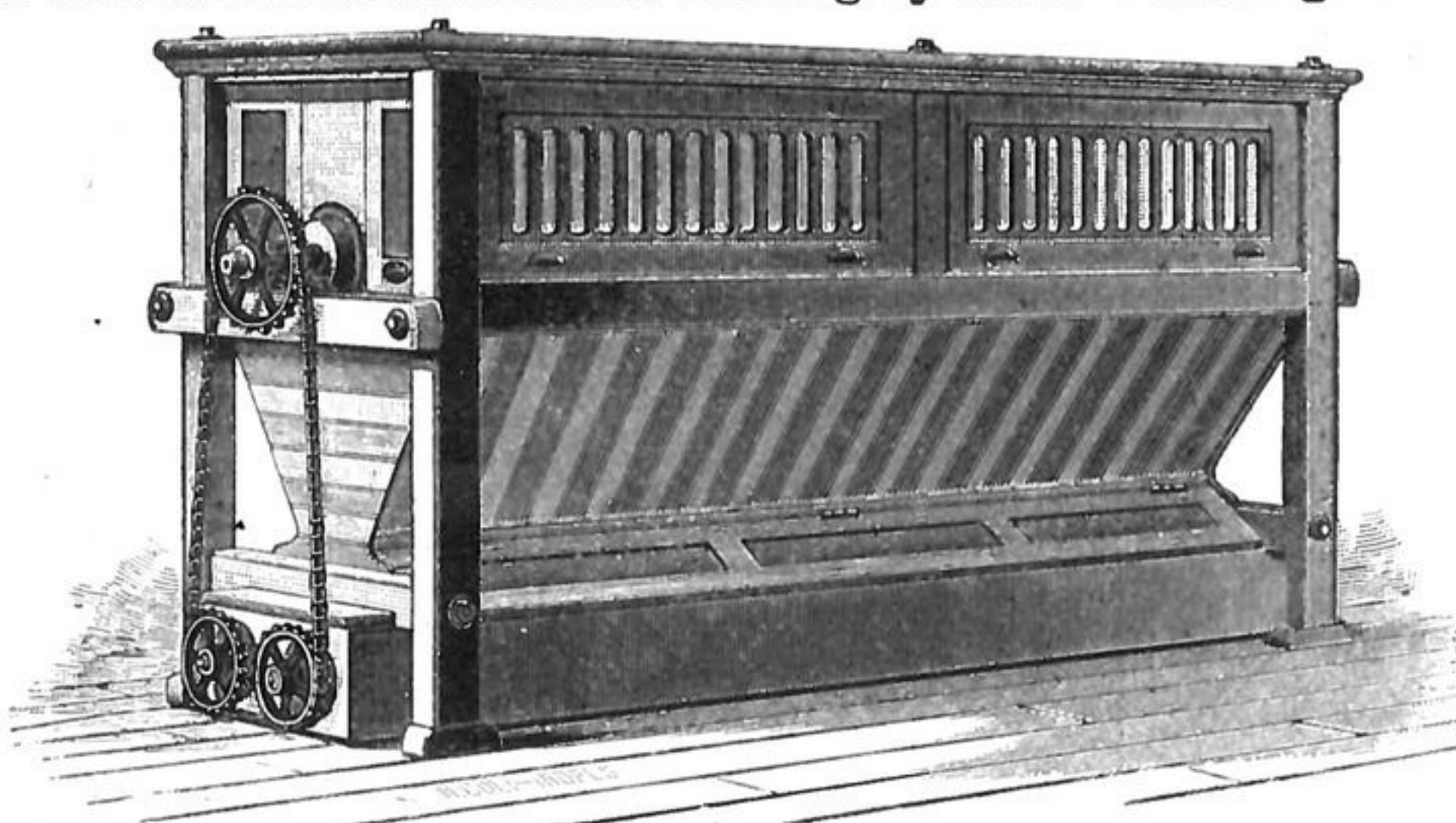


FIG. 1.—"SUCCESS" BOLTER AND DRESSER, PERSPECTIVE VIEW.

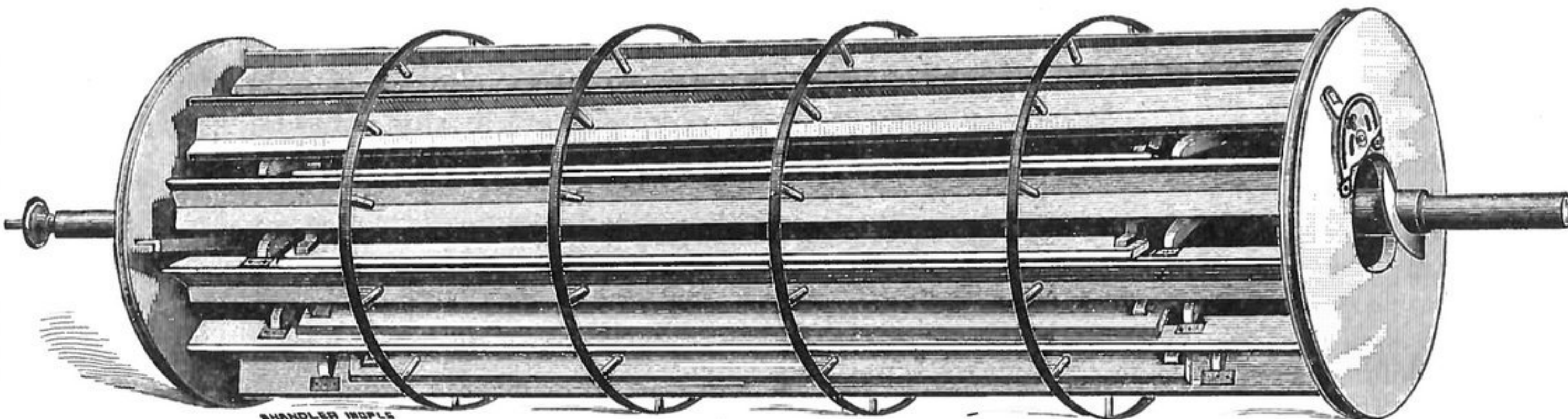


FIG. 3.—FRAMEWORK OF THE "SUCCESS" REEL.

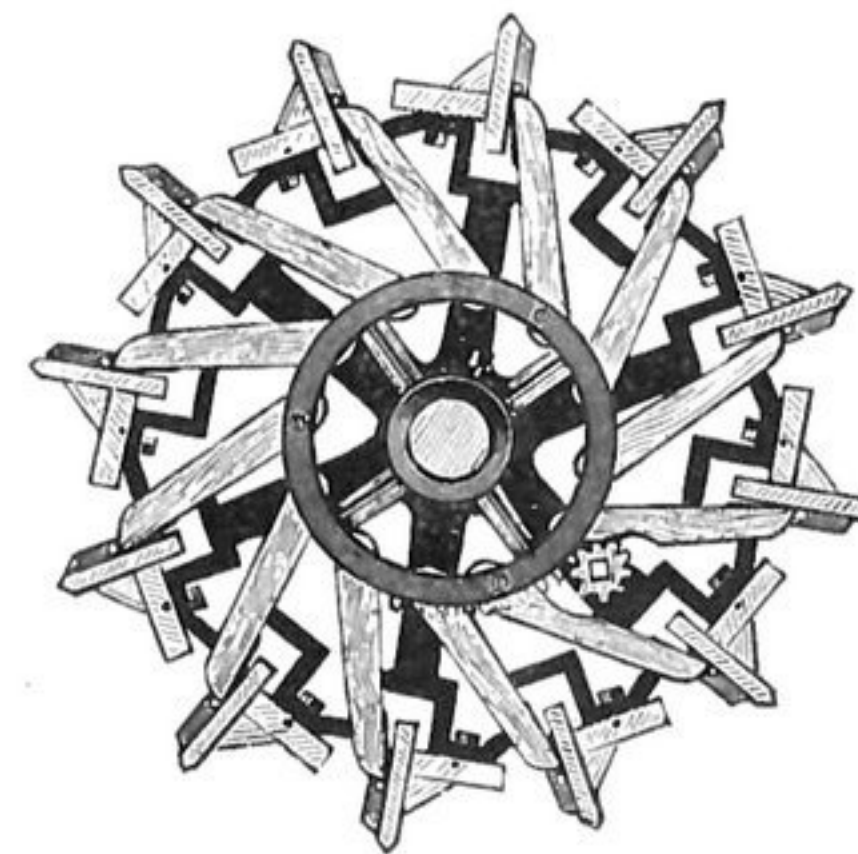


FIG. 2.—
END VIEW OF REEL.

which show the details perfectly at a glance. In Fig. 1 is shown a perspective view of the complete machine. In Fig. 2 is shown an end view of the reel, and in Fig. 3 is shown the frame-work of the reel. The inventor designed this machine to meet the demand for a machine not so severe in its action as the centrifugal, but possessing the ability to do more rapid and regular work than the old-style reel. It is but fair to add that the machine gives results more gratifying than the inventor had hoped for. By reference to Figs. 2 and 3 it will be seen that the interior of the bolting cylinder is provided with a series of elevating shelves, their backs being adjustable so that the space between them and the cloth may be increased or diminished, at one or both ends, to suit the charge of material upon the reel and also the kind of material. By this arrangement the machine is put under perfect control. With an ordinary charge they will usually be found to work best placed about one inch from the cloth at the head, and no more than one-fourth of an inch away from the cloth at the tail end of the reel, the object being to diminish the space proportionately to the decrease of material inside the reel. This is done by slacking the thumb-nut and slightly rotating a segment lever. Another leading feature of this bolter is that the cloth can be kept

stretched endwise so as to obviate the difficulty of the sagging between the circular ribs, which is very detrimental to bolting. This is done while the machine is in operation or standing by turning a nut at the end of the shaft, which draws the tail head of the reel toward the end of the machine,

stretching the cloth evenly from end to end. The machine is built of the best material, being principally of hardwood. The manufacturers endeavor to make it complete in workmanship and elegant in appearance, and they have succeeded in doing so. It is built in four sizes, the reel size being 6 feet 2 inches in No. 1 and each size adding a foot to the length of the reel. The reel diameter is uniformly 32 inches. Address the manufacturers for all further desired information.

JEWISH MATZE MAKING IN NEW YORK.

Following is an interesting account of making matzes among the Jews in New York city: Walking in Norfolk street, near Grand street, recently, a reporter came across two Hebrews carrying between them a basket filled with large circular biscuits. Upon the side of the basket was printed this, in fairly good-sized type:

"Matzes. From Grand Rabbi Joseph's bakery, 31 Norfolk street."

The Hebrews carried their basket to 23 Hester street and gave it to two young men, who removed the biscuits from the basket into paper bags of various sizes, which they placed upon tables near them. The reporter found at 23 Hester street a small man, delicately featured, with neat bushy whiskers and hair.

"I am making these matzes under direction of Grand Rabbi

Joseph," he said, gesticulating with his fingers and hands. "You know that matze is the name of the unleavened bread that the Hebrews eat during Passover. Matze is the German for Passover bread. Before the Grand Rabbi came to this city, and for some time afterward, matzes were made by machinery. In fact they are so made now by Hebrew rabbis; but that is contrary to the customs and traditions of the Jews. It is customary to use the utmost caution in making the matze, a little more so than any other article of food used by the Jews. The machine-made matze is cheaper than the matze we make, which is entirely hand-made and within the strict rule of the Hebrew faith. The Grand Rabbi has given our matze his strict approval, and it is eaten by all his congregation."

The bakery in Norfolk street is much like other bakeries on the east side, only that, instead of empty and filled barrels and dough trays lying promiscuously about, all the room is taken up with human beings. There are sixty females, of all ages, sizes and styles of beauty, busily rolling out balls of dough. Old and young men are sandwiched there, so that it is with difficulty that one can move about. Mr. G. Schoolman, who knows all about matzes, says: "The flour from which the dough is made is specially ground in a mill at West Nyack by Jews from carefully selected wheat. Great care is taken that no impurities get into the wheat. After it is ground, a sample is carried to Grand Rabbi Joseph in his house in this city, and he approves of it or not, according as it meets his notions. With his consent it is put in barrels, clean new ones, marked especially for the occasion. When brought in here it is fetched into a room outside of the bake-shop, a narrow place built for a coal cellar. The barrels of flour are stowed carefully alongside the wall. Four men work there. Two knead the dough in wooden dishes, and one carries flour and the other water from opposite corners. There is one man to ladle the flour from the bin into the wooden dough tray, another to pour a cup of water into the tray afterward. It is absolutely necessary that there should be two men, for if only one were employed specks of flour would get into the water, and drops of water into the flour. This would be a dreadful state of things, for the flour might get sour. In order to get the water clear of all impurities, it is brought in over night and allowed to settle, and in dipping the water out the man is careful not to stir it. These two men rest while not pouring flour or water into the dough trays and until the dough is carried out into the outer room.

The dough is kneaded hard, and care is taken to prevent impurities getting into it anywhere. It is now a roll of dough weighing about ten pounds. It is then cut into chunks by a man who does nothing else, and carried by another man, hired for just that sole purpose, to the females, who proceed to roll out the chunks into flat dough. Men pick up the flat pieces and toss them to another set of men, who roll over them two sets of wheels, impressing little diamonds on the biscuit. They are then placed by a man upon a ladle. Another keeps shoving them into the oven and pulling them out, tossing them on tables. The women flatten the dough by hand. While this is done a Hebrew comes with sand-paper and glass and removes any specks of dough from the rolling pins. The women stand close together and beat a tattoo as they keep up a continual roll upon the board. The baking of matzes can only be carried on during daylight. Work begins at daylight and stops at sundown. They work until noon on Friday. The matzes sold from this bakery bring 11 and 12 cents a pound, while the machine-made fetch 6 and 7 cents. Just before Passover a highly-prized matze is baked for all the holy men among the Hebrews, and is disposed of at upward of 40 and 50 cents a pound."

AMERICAN BREADSTUFF EXPORTATION.

According to the statement of the Bureau of Statistics of the Treasury Department the breadstuff exports in February, 1889, amounted to \$8,293,765, against \$10,160,889 in February, 1888. For the first two months of 1889 the total is \$19,126,989, against \$18,504,187 for the first two months of 1888. For the eight months ending with February, 1889,

the total is \$82,108,465, against \$92,714,324 for the same period of the preceding year. The record shows a repetition of the history of the past months in wheat and wheat flour. In February, 1889, the wheat-grain exports were 1,585,629 bushels, worth \$1,392,645, against 4,838,320 bushels, worth \$4,102,963 in February, 1888. For the eight months ending February, 1889, the total was 33,705,970 bushels, worth \$30,783,551, against 52,793,197 bushels, worth \$45,261,831 in the same period of the preceding year. In February, 1889, the wheat-flour exports were 666,778 barrels, worth \$3,343,151, against 996,340 barrels, worth \$4,613,978 in February, 1888. In the eight months ending with February, 1889, the total was 6,227,466 barrels, worth \$30,190,536, against 8,273,757 barrels, worth \$37,890,433 in the same period of the preceding year. The minor lines show for the eight months ending with February, 1889, compared with the same period of the preceding year, the following changes in values: Barley \$796,811, against \$172,697; corn \$19,303,654, against \$8,653,133; corn-meal \$613,349, against \$512,199; oats \$186,367, against \$85,402; oatmeal \$175,678, against \$114,373; rye \$58,519, against \$24,256. Every minor article shows a decided increase. The only loss is in wheat grain and flour, and this is accounted for by the shortage in the wheat supply. Pessimistic observers should be encouraged by these figures. The breadstuff trade of the United States is not dead yet.

CANADIAN TRICKS IN GRAIN SELLING.

Canadian grain-growers seem to be able to teach new tricks in business. Says the Minnedosa, Manitoba, "Tribune" in a recent number: A farmer brought a load of grain to town yesterday, and on examination by Mr. Wake it was purchased at 88 cents per bushel, but on emptying the load it was discovered that the bags were what is termed "plugged," about one quarter of the bagful at the top being good grain and the other three-quarters a very inferior quality and not considered worth more than about 40 cents per bushel. The dealer confiscated the grain, bags and all, and the farmer, who was liable to arrest and punishment for the fraudulent practice, was very glad to get off so easily. This is the fifth case of this kind that has been discovered, and the dealers will be very apt to deal more seriously with the next one caught.

SPECIAL NOTICES.

LIBERAL OFFER.

With a view of increasing our subscription list, we will send a copy of R. J. Abernathey's new book, "The True Short System" (Price \$2.00) and "The Milling World" for one year at the very low price of Two Dollars. Renewal will be treated same way. This offer will only continue for a limited time. Now is your chance. Send in your subscriptions at once.

Address,

THE MILLING WORLD, BUFFALO, N. Y.

BOLTING CLOTH.

Do not order your cloth until you have conferred with us. It will pay you, both in point of quality and price. We are prepared with special facilities for this work. Write us before you order.

CASE MANUFACTURING CO..

Columbus, Ohio.

Office and Factory, 5th Street, north of Naughten.

TOLEDO MILL PICKS AND STONE TOOL MFG. CO.

Manufacturer

and Dresser of

MILL PICKS.

Made of the best double-refined English cast steel. All work guaranteed. For terms and warranty, address, GEO. W. HEARTLEY, No. 297 St. Clair Street, Toledo, Ohio. Send for Circular.

N. B.—All Mill Picks ground and ready for use (both old and new) before leaving the shop. No time and money lost grinding rough and newly dressed Picks. All come to hand ready for use.

ALSO MANUFACTURERS OF

Shafting, Pulleys, Hangers, Coupling, Machine and Jobbing, Etc., Etc.

Practical Notes

WOODEN BATTERY JARS.—An improvement has been introduced in the manufacture of battery jars from wood-pulp, which considerably increases their power of resisting the battery solutions while removing all danger from the leakage which has heretofore sometimes been the result of imperfect treatment. These jars are made from ground wood in the same manner as the well-known pails and similar utensils, but after having been formed and dried are treated by immersion in a composition which penetrates the pulp and renders the jar acid proof. It has been difficult in the past to insure in the case of every jar a thorough penetration of each fiber by the protecting compound, owing to the considerable amount of air which the fibers themselves and the spaces between them contain. This difficulty has now been surmounted by the ingenious device of treating the jars in a vacuum, whereby the air is removed, and then, while the jars are still submerged, admitting air on top of the fluid used for treating. The air pressure thus forces the compound into every portion of the material forming the jar and renders certain the protection of every fiber.

GENERAL NOTES.

In 1866 a Corliss engine was placed in the machine-shop of the Union Pacific Railroad at Sacramento, Cal. The engine has a 4-foot stroke and an 18-foot belt-wheel, and it has been run continuously since it was placed there, frequently running night and day, often until 10 o'clock at night. Up to this date scarcely \$100 have been spent for repairs upon it. Allowing but ten hours a day and 300 working days to a year, this engine has been working 66,000 hours, at the smallest calculation, since it was placed in motion. The belt-wheel makes 70 revolutions per minute, and for the 66,000 hours it has been going has made 277,200,000 revolutions. The circumference of the belt-wheel is 56½ feet and in making the 277,200,000 revolutions has traveled a distance of 15,651,800 feet or 2,964,354 miles, equivalent to more than 100 times around the earth. The belt-wheel has traveled at the rate of 45 miles per hour.

COMMENDATORY LETTERS.

SATISFIED WITH THE AVERY BUCKETS.

OFFICE OF STILWELL & BIERCE MFG. Co.,
THE AVERY STAMPING COMPANY. DAYTON, O., JAN. 11, 1889.

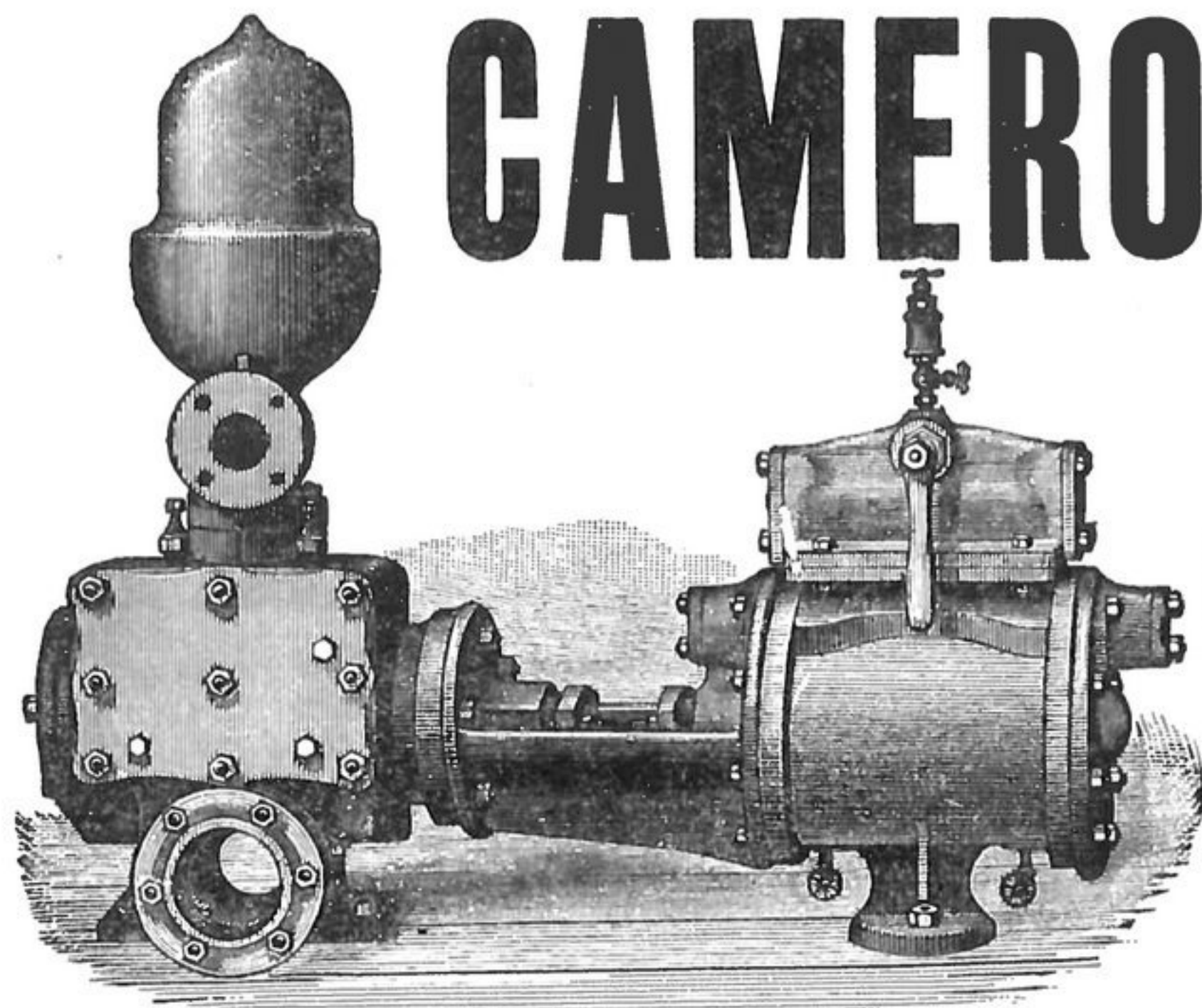
GENTS: We take pleasure in expressing to you our high opinion of the merits of your seamless elevator buckets. They give satisfaction both to us and to our customers. Yours truly,

STILWELL & BIERCE MFG. Co.

FOREIGN WEIGHTS AND MEASURES.

Following is a valuable reference table of foreign weights and measures, often used without explanation in American publications, together with their equivalents in United States weights and measures, as adopted by the United States Treasury Department January 1, 1888:

| Denomination. | Where used. | U. S. Equivalent. |
|-----------------------|--|-------------------------|
| Almude..... | Portugal..... | 4.422 gallons. |
| Ardeb..... | Alexandria..... | 7.5907 bushels. |
| Aratel or libra..... | Portugal..... | 1.011 lbs. avoird. |
| Arroba..... | Portugal and Brazil..... | 32.38 pounds. |
| Do..... | Spain and Buenos Ayres..... | 25.36 pounds. |
| Do..... | Spain (wine)..... | 4.26 gallons. |
| Artal..... | Morocco..... | 1.12 pounds avoird. |
| Baril..... | Argentine Repub. and Mexico..... | 20.0787 gallons. |
| Candy..... | Bombay..... | 560 pounds avoird. |
| Do..... | Madras..... | 500 pounds avoird. |
| Cantar..... | Turkey..... | 124.7036 pounds avoird. |
| Catty..... | China..... | 1.333 pounds avoird. |
| Do..... | Japan..... | 1.31 pounds. |
| Do..... | Java, Siam, Malacca..... | 1.35 pounds. |
| Do..... | Sumatra..... | 2.12 pounds. |
| Centner..... | Bremen..... | 127.5 pounds. |
| Do..... | Brunswick..... | 117.5 pounds. |
| Do..... | Darmstadt & Zollverein..... | 110.24 pounds. |
| Do..... | Denmark & Norway..... | 110.11 pounds. |
| Do..... | Nuremberg..... | 112.43 pounds. |
| Do..... | Prussia..... | 113.44 pounds. |
| Do..... | Vienna..... | 123.5 pounds. |
| Fanega..... | Mexico..... | 1.54728 bushels. |
| Do..... | Peru..... | 140 Castilian lbs. |
| Gramme..... | Metric..... | 15.432 grs. avoird. |
| Hectoliter..... | Do..... | 26.417 quarts. |
| Kilogram or kilo..... | Do..... | 2.2046 lbs. avoird. |
| Kilometer..... | Do..... | 0.621376 miles. |
| Last..... | Belgium & Holland (dry)..... | 85.134 bushels. |
| Do..... | England (dry malt)..... | 82.52 bushels. |
| Do..... | Prussia..... | 112.29 bushels. |
| Libra..... | Castilian..... | 7100 grains troy. |
| Do..... | Chili..... | 1.014 lbs. avoird. |
| Liter..... | Metric..... | 1.026 quarts. |
| Livre..... | Guiana..... | 1.0791 lbs. avoird. |
| Maund..... | Bengal..... | 82.285 lbs. avoird. |
| Do..... | Bombay..... | 28 pounds avoird. |
| Do..... | Madras..... | 25 pounds avoird. |
| Meter..... | Metric..... | 39.37 inches. |
| Do..... | Metric (cubic)..... | 1.308 cubic yards. |
| Do..... | Metric (square)..... | 1550.0 sq. inches. |
| Oka..... | Egypt..... | 2.7235 lbs. avoird. |
| Do..... | Hungary..... | 3.0817 lbs. avoird. |
| Do..... | Turkey..... | 2.83418 lbs. avoird. |
| Picul..... | Borneo & Celebes..... | 135.64 pounds. |
| Do..... | China & Sumatra..... | 133½ pounds. |
| Do..... | Japan..... | 130 pounds. |
| Do..... | Java (Batavia)..... | 135.10 pounds. |
| Do..... | Hemp & Manila, Phil. Isl..... | 139.45 pounds. |
| Do..... | Sugar of Manila, Philippine Islands..... | 140 pounds. |
| Pie..... | Argentine Republic..... | 0.9478 feet. |
| Do..... | Castilian..... | 0.91407 feet. |
| Pik..... | Turkey..... | 27.9 inches. |
| Quarter..... | England..... | 8.252 bushels. |
| Quintal..... | Brazil..... | 130.06 lbs. avoird. |
| Do..... | Buenos Ayres..... | 101.42 lbs. avoird. |
| Do..... | Castile, Chili, Mexico, Peru..... | 101.61 lbs. avoird. |
| Do..... | Metric..... | 220.47 pounds. |
| Tael..... | Cochin-China..... | 590.75 grains troy. |
| Tonde (ton)..... | Denmark..... | 3.94783 bushels. |
| Vara..... | Castilian..... | 0.914117 yard. |
| Do..... | Curacao, Cuba & Peru..... | 33.375 inches. |



CAMERON STEAM PUMP

THE STANDARD OF EXCELLENCE.

SIMPLE! COMPACT! DURABLE!

"NO OUTSIDE VALVE GEAR."

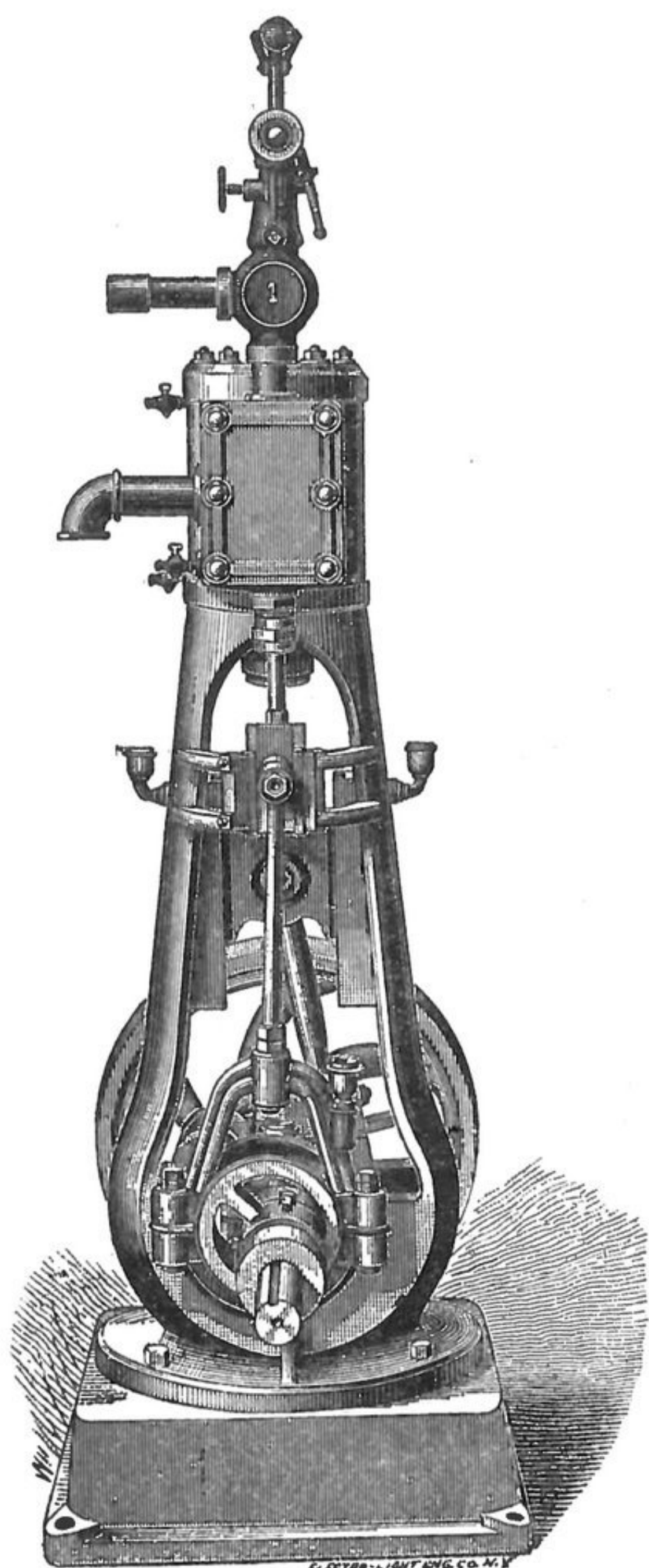
Steam, Air & Vacuum Pumps in Every Variety

FOR ILLUSTRATED CATALOGUE ADDRESS

THE A.S. CAMERON STEAM PUMP WORKS

Foot of East 23d Street, - New York.

AUTOMATIC VERTICAL ENGINES



Especially adapted for Small Electric Light Plants. Perfect Regulation. Reversible Link Motion for Marine Use. Five to Fifteen Horse Power. Also manufacturers of

Lathes and Special Tools

Metal Patterns, Models and Machinery Built to Order. Send for Prices and Specifications.

Lloyd & Sterrett

COR. 16TH AND STATE STS.,
ERIE, - - PENN.

EAGLE IRON WORKS, DETROIT, MICH.

MANFRS. OF HIGH GRADE



HORIZONTAL, UPRIGHT
PORTABLE AND MARINE.

Oil Tanks & Smoke Stacks,

HEAVY SHEET IRON WORK.

CORRESPONDENCE SOLICITED.

PAYNE HIGH SPEED CORLISS ENGINE

SHAFT GOVERNOR COMBINED WITH CORLISS WRIST-PLATE.

ECONOMY OF FUEL.

REGULATION EQUAL TO ANYTHING IN USE.

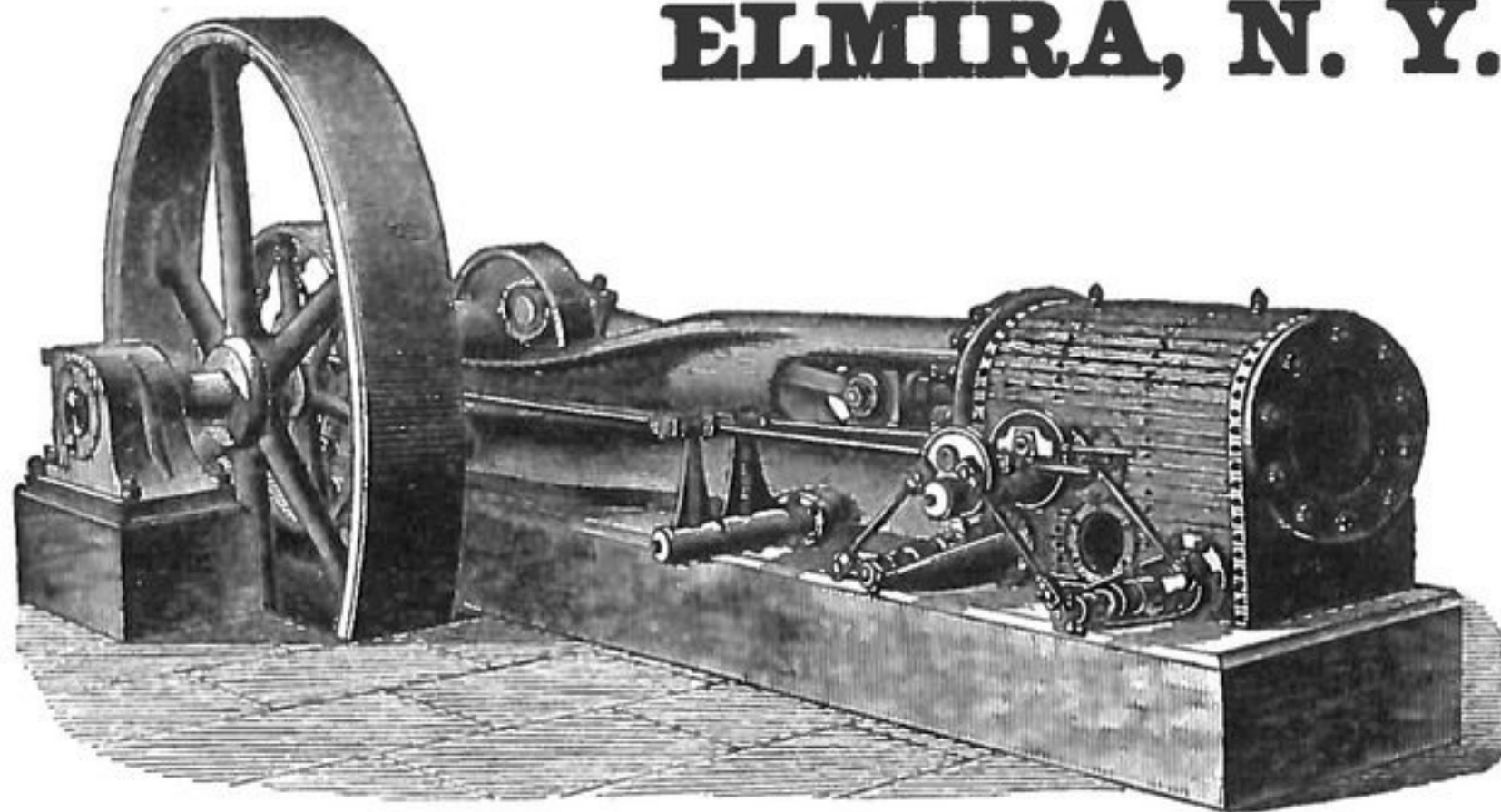
B. W. Payne & Sons,

ELMIRA, N. Y.

10 S. Canal Street,
CHICAGO, ILL.

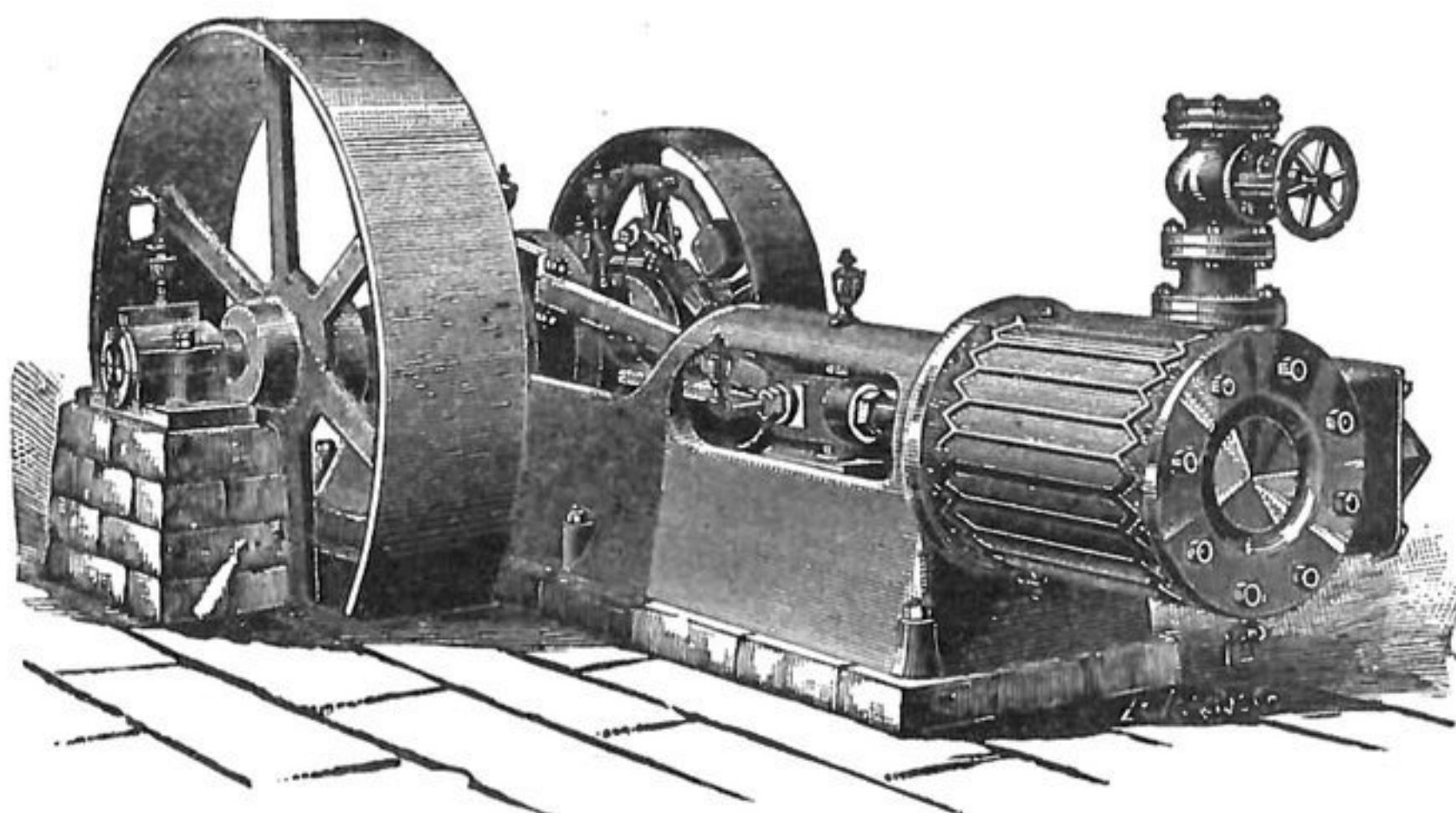
45 Dey Street,
NEW YORK.

Hill, Clark & Co.
BOSTON, MASS.



AUTOMATIC ENGINES FROM 2 TO 200 HORSE POWER.

Economic Power Plants



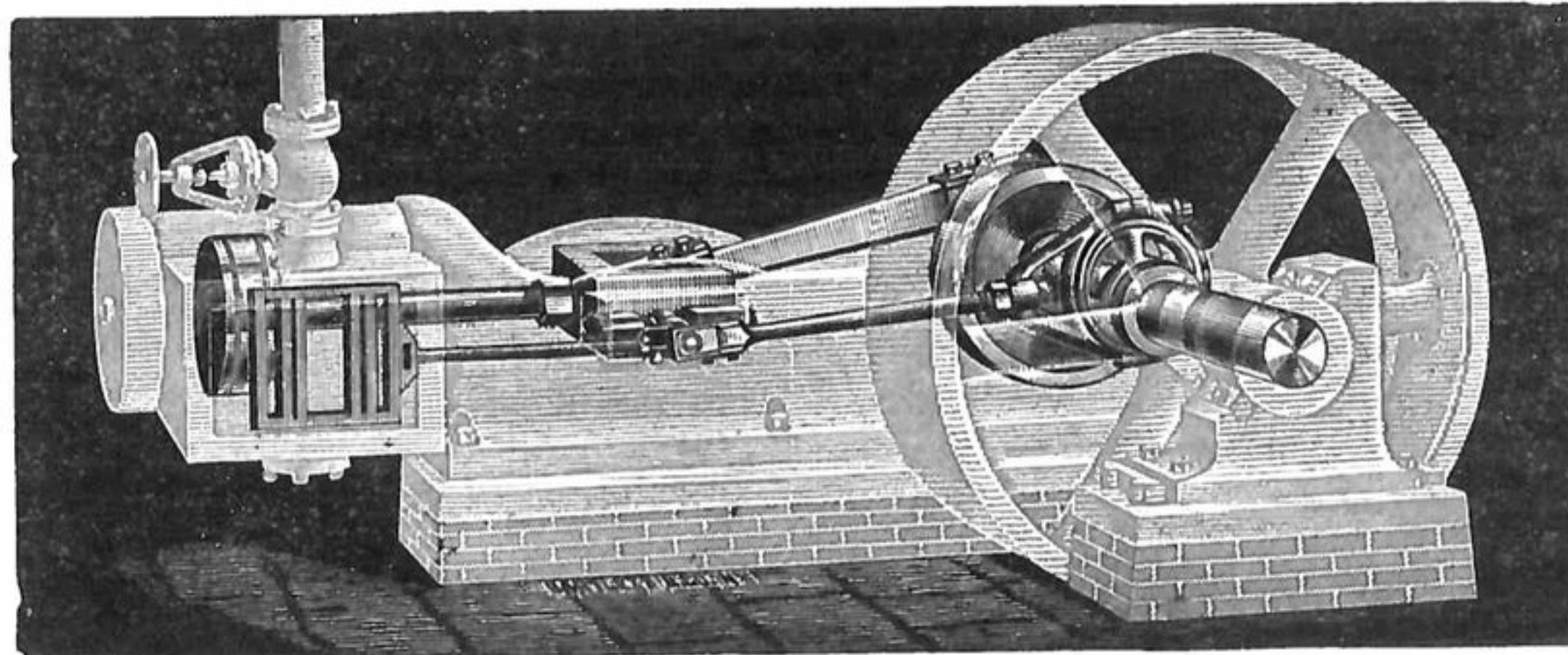
Especially Adapted to Electric Lighting and

WOOD-WORKING ESTABLISHMENTS

MANUFACTURED BY

VALLEY IRON WORKS, WILLIAMSPORT, PENN.

THE NEW PORTER HEAVY-DUTY ENGINE.



The Most Power for the Money, and All Things Considered the Most Economical.
For Illustrated Circular Address,

PORTER MANUFG. CO., LIMITED, SYRACUSE, N. Y.



H. Putman, miller, Wilnot, O., failed.
 S. B. Locke, mill, West Paris, Me., sold out.
 The Pendleton, Ore., Roller Mills, incorporated.
 A. B. Krom, grist-mill, Accord, N. Y., assigned.
 The Green, Ia., Water Power Mill Co. foreclosed.
 Crew's Station, Ala., men are building a grist-mill.
 Mrs. L. Pender, mill-owner, Marysville, Cal., is dead.
 The Rockwall, Tex., Milling Co. build a 200-barrel mill.
 J. Franey's mill, Binghamton, N. Y., burned; loss \$2,000.
 J. Morrison, miller, Barton, Md., now J. O. Mullan & Co.
 James & Gold Bros., Gordonsville, Tenn., started a grist-mill.
 Hunt & Roberts, millers, Alexandria, Va., now Walter Roberts.
 Fisch & Haywood's elevator, Davenport, Ia., burned; loss \$40,000.
 J. K. Gilbert, feed-mill, Kalamazoo, Mich., sold to Geo. C. Winslow.
 Summerville, Ga., men have formed a stock company to build a grist-mill.

Wm. P. Huff, Roanoke, Va., puts \$4,000 worth of new machinery in his roller mill.

Carr & Tolle's new mill, Maysville, Ky., will have a daily capacity of 150 barrels.

The Iona Milling Co., Porchtown, N. J., now the Iona Improvement Co., incorporated.

Geo. F. Hunter, Maysville, Ky., will enlarge and operate the flour-mill of Robinson & Co.

Hurin's Sons, millers and dealers, Cincinnati, O., are removing to Little Falls, Minn.

The rainfall on the Pacific slope has caused a big break in the San Francisco wheat market.

Funk & Anderson, Somerset, Ky., will improve their flour-mill and add a feed-mill to the plant.

Grissom, Ritchie & Williams, Barkersville, Ky., will rebuild their burned flour-mill in the spring.

Birmingham, Ala., has promise of a flour-mill by the Carlisle Mill Co., an Illinois firm that is opening a wholesale grain and flour business there.

T. B. Fowler and others, Murfreesboro, Tenn., incorporated the Farmer's Warehouse & Elevator Co., capital \$15,000, to build a large elevator at once.

J. K. Lane and others, Liberty Hill, Tex., have incorporated the Liberty Hill Roller Mill Co., capital \$10,000, to build a mill at once. They want machinery.

The "Victoria" flouring-mill, St. Louis, Mo., was damaged \$10,000 by a boiler explosion on March 10. Patrick McMahon, the fireman, and Neill Brown were killed. Several others were injured.

Kurtz & Son's steam roller mill, Center Hall, Pa., with a grain-house, a dwelling and Bartholomew & Co.'s elevator, burned March 8. Kurtz & Son lost \$25,000, with \$5,000 insurance, and Bartholomew & Co. lost \$10,000, with small insurance. The origin of the fire is not known.

It is said that in Manitoba this year's spring is the earliest ever known since the settlement of the province. At Winnipeg a few days ago a considerable portion of the government experimental farm was seeded. Sowing is expected to be general within a very short time unless some unexpected weather change occurs.

Says the *Baltimore Journal of Commerce*: We had the pleasure on Wednesday last of making the acquaintance of Messrs. H. J. and Horace M. Deal, of Bucyrus, O. These gentlemen came on to the inaugural ceremonies and were glad of the opportunity offered to run over to Baltimore, thereby combining business with pleasure.

Reports from Walla Walla, Washington Territory, estimate 75,000 bushels of wheat in farmers' hands and 50,000 bushels in speculators' hands. Some of the millers have shut down for the want of wheat. The growing crop of winter wheat is looking well, and prospects are favorable for a good yield provided the rainfall is increased.

Successful results from the sowing of No. 1 hard spring wheat are reported from Michigan, the experiments having been made on the last crop. The grain was sown in April, mostly on sod ground, and produced over 25 bushels per acre. It was grown in the vicinity of Monroe. A Toledo firm instigated the test and will send out more of the seed this year to Ohio points.

In spite of the low prices of potatoes in New York, several small lots have recently been sent to that city from Glasgow and Hamburg, probably as trial shipments, but it shows that tubers must be very plentiful on the continent and in Great Britain, when holders there appear anxious to find a market in the United States, when prices are unusually low for this season of the year.

Probably the finest display of water-columns ever exhibited was that of "Reliance" safety water-columns made by the Reliance Gauge Co., of Cleveland, O., at the recent annual meeting and exhibition of the National Electric Light Association at Chicago. It embraced finished brass, nicked and japanned columns of all sizes, including both low and combined high and low water alarms, together with the patent solder-

less floats and other essential parts of their construction. It attracted more attention than some of the electrical exhibits.

Says the *Bucyrus, O., Evening Telegraph* of March 12: The Northern Ohio Millers' Convention closed its session yesterday, returning thanks to the M. Deal Co. and the H. J. Deal Specialty Co. for their courtesies. The next meeting will be held at Norwalk in June, when C. A. Andrews, of La Grange, will read a paper on the subject of exchanging flour and wheat. A special meeting was fixed for Elyria on April 16. An interesting feature was the presenting to each member by the H. J. Deal Specialty Co. a number of flour-triers fastened together and containing the officers of the association, the members present, and the points of interest, together with a genuine flour-trier.

BOOKS AND PAMPHLETS.

Hidden things appeal to the human instinct of curiosity and the skillful puzzle-solver and the patient scientist are only indulging a common propensity. *Good Housekeeping* offers in its department of "Quiet Hours with the Quick Witted" one of the most attractive fields for the exercise of the investigating faculty. In the issue for March 16 the Inauguration Ball is utilized for this purpose. A very skillfully written poetical description of the ball is given in which the names of people of prominence in politics, literature or other directions are interwoven with the text in such a way as to require careful search to find them out and identify them. Prizes of \$10 and \$15 are offered for those who discover the greatest number, and the Ball bids fair to prove as popular as the "Hidden Menagerie."

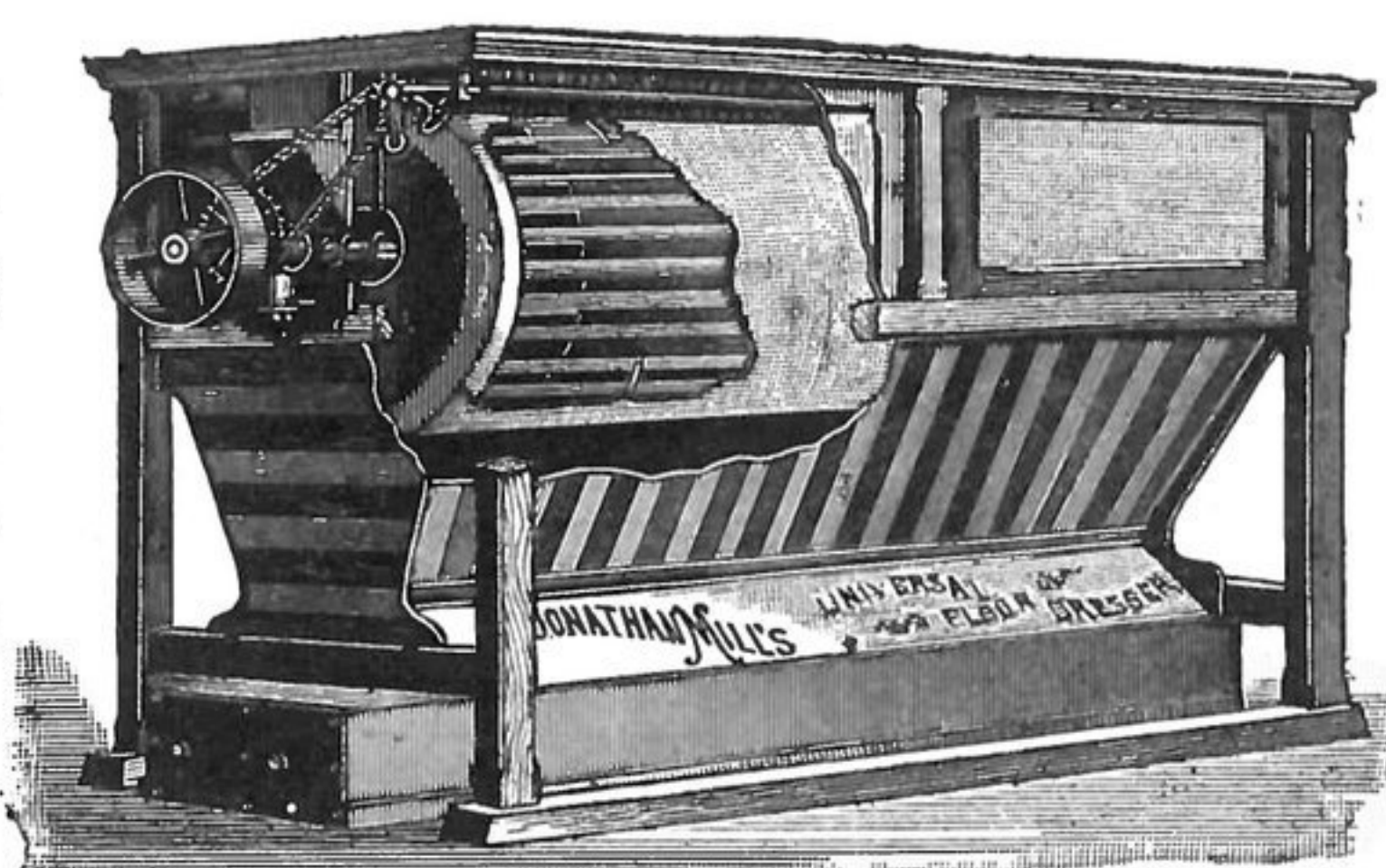
AN AMERICAN PATENT IN EUROPE.

American millers will be greatly interested in the following statement concerning a well-known American roller-mill made by the Neenah, Wisconsin, "Gazette" in its issue of March 9: "For several days it has been reported that John Stevens, who is now traveling in Europe, had become involved in some litigation in either Austria or Germany over an alleged infringement on his part of a roller-mill patent, and that John Davis, who is on his way home from Europe, was called there on account of the difficulty in which his partner was involved. Rumor is also that it had cost Mr. Stevens some money to settle the suits. A well-known mill-man while in conversation regarding the affair made the statement that the recent supreme court decision in regard to barb fence wire had probably encouraged the foreigner to jump on the patentee of the roller mill in the United States, in hope of getting a big boodle, and how well he succeeded nobody except the principals can tell. It is also said that Mr. Stevens wrote to the well-known mill-furnishing house of John T. Noye and Co., of Buffalo, N. Y., which house had exclusive right to make the Stevens roll, asking advice in regard to the subject, and that firm advised him to settle on some kind of a basis with the foreigners. This will not be pleasing news to Neenah friends of Mr. Stevens, that a pleasure trip to the old country should be so handicapped by the annoyance of a law-suit with a lot of foreigners who claim a patent on a roller-mill."

THE MARCH AGRICULTURAL REPORT.

The Department of Agriculture's report for March says: The amount of corn reported still on hand is 39.6 per cent. The surplus amounts to 787,000,000 bushels, of which the seven corn states have 499,000,000 bushels. The proportion merchantable averages 82 per cent., which is less than in 1884, 1886 or 1887. The average price is less than in December, when it was 44 cents per bushel for the United States and 27 for the states producing commercial supplies. The March average for merchantable corn is 33.9 cents per bushel, for unmerchantable 22.8 cents per bushel. The general average of the seven states, Ohio, Indiana, Illinois, Iowa, Missouri, Kansas and Nebraska is 25.6 cents per bushel. The proportion of wheat crop on hand March 1 is less than in any year since 1880, except in 1882 and 1887, though nearly the same in the latter year. The actual quantity on hand is less than in any recent year except 1882 and 1886. It is estimated at about 112,000,000 measured bushels. The lowest state percentages are in the principal wheat-growing states, as follows: Ohio 27, Michigan 23, Indiana 24, Illinois 25, Wisconsin 28, Minnesota 26, Iowa 32, Missouri 27, Kansas 24, Nebraska 31, Dakota 24. In these states the quantity on hand is less than in March last by about 21,000,000 bushels. The details of quantity and weight of wheat will be given in the printed reports.

MILLERS of the United States and Canada write us for our new pamphlet and revised price list of our **Jonathan Mills UNIVERSAL FLOUR DRESSER**. The best machine on the market. Giving satisfaction everywhere in the best mills in this country. Thousands in use. We carry a full line of Crown Silk anchor Bolting Cloth and Grit Gauzes.



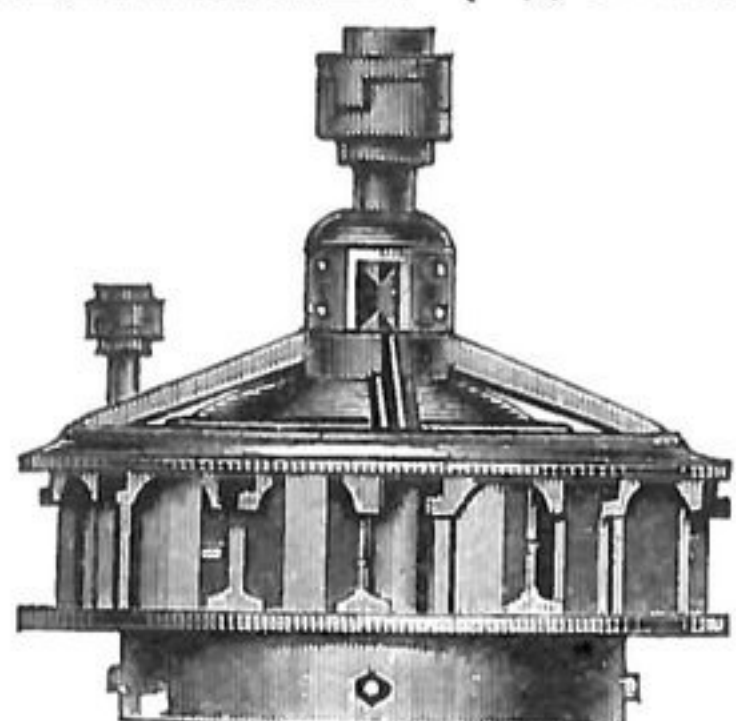
WE SOLICIT YOUR TRADE.

The Jonathan Mills Mfg. Co., Cleveland, Ohio, U. S. A.

THE IMPROVED "SUCCESS"

THIS WHEEL IS BOTH DURABLE AND CHEAP

PERCENTAGE: { Full Gate..... 86.29
3/4 Gate..... 86.07
1/2 Gate..... 81.25



SEND FOR PAMPHLET TO

S. Morgan Smith, York, Pa.

ATTENTION MILLWRIGHTS!

A BOOK YOU ALL WANT.

LEFFEL'S CONSTRUCTION OF MILL DAMS

AND

BOOKWALTER'S MILLWRIGHT & MECHANIC

A STANDARD WORK.

This practical work of 288 pages gives with full illustrations and complete detail how to build or repair all kinds of mill dams.

PRICE FIFTY CENTS.

Or will be sent with a copy of "THE MILLING WORLD" for one year (postage prepaid) for \$1.25. —ADDRESS—

McFAUL & NOLAN,
DRAWER 203, BUFFALO, N. Y.

PLEASE mention THE MILLING WORLD when you write to advertisers. It will pay you to do this.

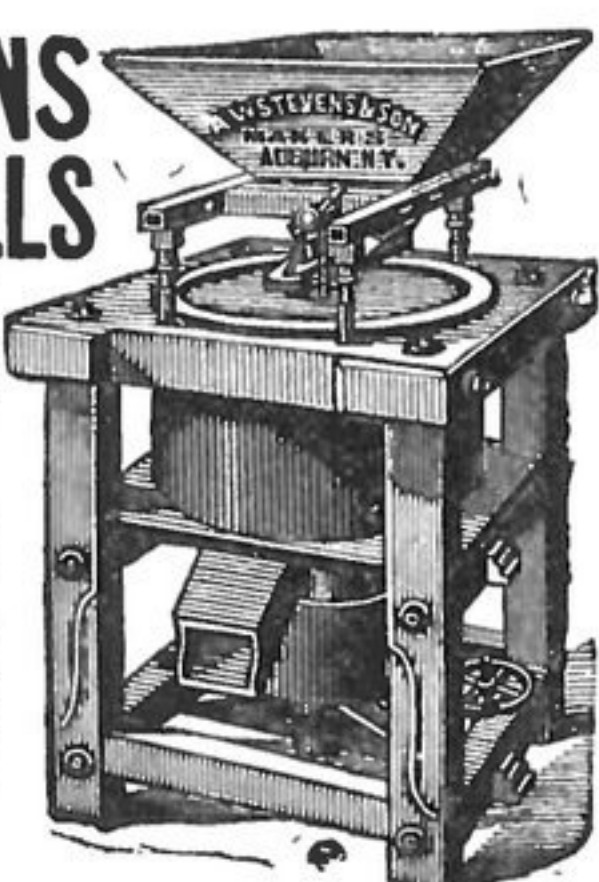
THE STEVENS PORTABLE MILLS

For CORN and FEED GRINDING

Genuine French **BUHR STONES**

PowerCornSheller
Prices Below the Lowest
A.W. STEVENS & SON

AUBURN, N. Y.
Mention this paper.



SCRIBNER'S MAGAZINE

PUBLISHED MONTHLY
WITH ILLUSTRATIONS

AN IMPORTANT CLUB OFFER

SCRIBNER'S MAGAZINE

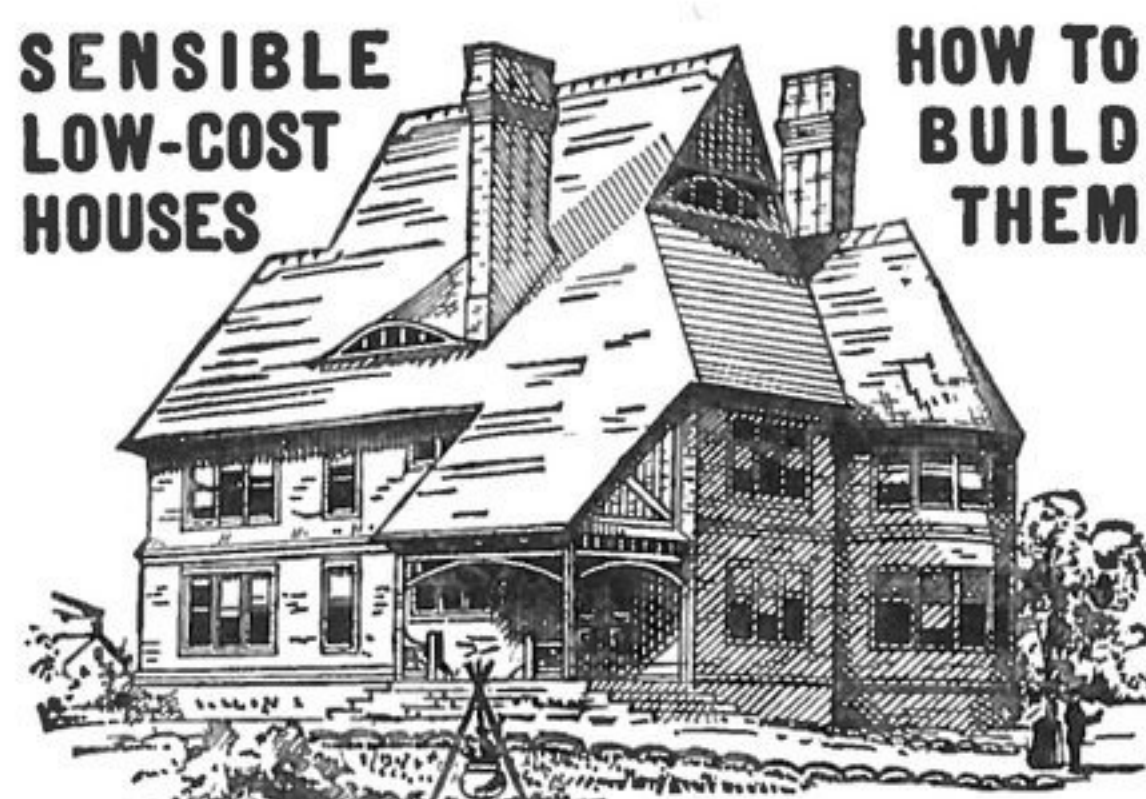
Gives its readers literature of lasting interest and value. It is fully and beautifully illustrated and has already gained a more than national circulation exceeding 125,000 copies monthly.

PRICE 25 CENTS A NUMBER \$3.00 A YEAR

SPECIAL ARRANGEMENTS with Messrs. Charles Scribner's Sons the Publishers enable us to offer **SCRIBNER'S MAGAZINE** with the

MILLING WORLD at \$3.50 a year. Send in your Subscription at once. Address, **THE MILLING WORLD, BUFFALO, N. Y.**

SENSIBLE LOW-COST HOUSES HOW TO BUILD THEM



A large Atlas, giving illustrations and full descriptions of 56 desirable modern houses, costing from \$800 to \$7500. Every detail profusely illustrated, showing many valuable original ideas. Shows what to do and what not to do. Houses adapted to all climates described. The latest, best, and only cheap work published. Sent by mail on receipt of \$1.00. **NATIONAL ARCHITECT'S UNION, PHILA., PA.**

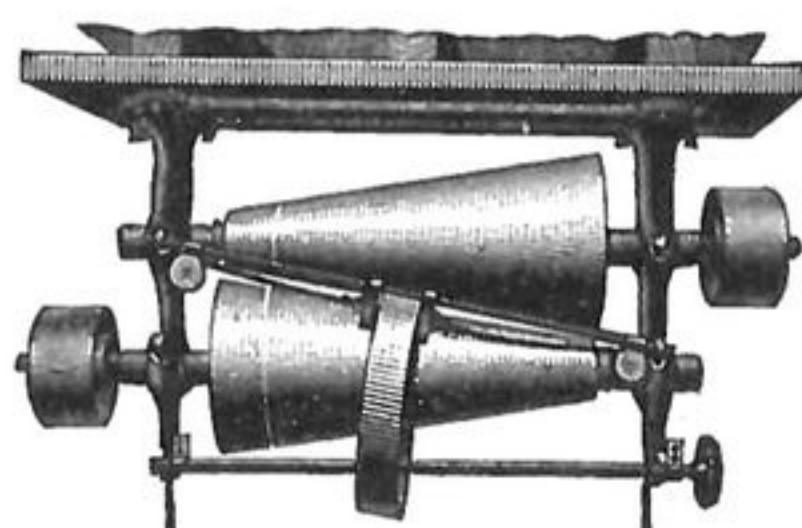
"Cooper on Belting"

A Treatise on the Use of Belting for the Transmission of Power. With illustrations of approved and actual methods of arranging Main Driving and Quarter Twist Belts, and of Belt Fastenings. Examples and Rules in great number for exhibiting and calculating the size and driving power of belts. Plain, Particular and Practical Directions for the Treatment, Care and Management of Belts. Descriptions of many varieties of Beltings, together with chapters on the Transmission of Power by Ropes; by Iron and Wood Frictional Gearing; on the Strength of Belting Leather; and on the Experimental Investigations of Morin, Briggs, and others, for determining the Friction of Belts under different tensions, which are presented clearly and fully, with the text and tables unabridged. By **JOHN H. COOPER, M. E.** Second Edition. One vol., demi octavo. Cloth, \$3.50. Sent post-paid on receipt of price. Address,

McFAUL & NOLAN, BUFFALO, N. Y.

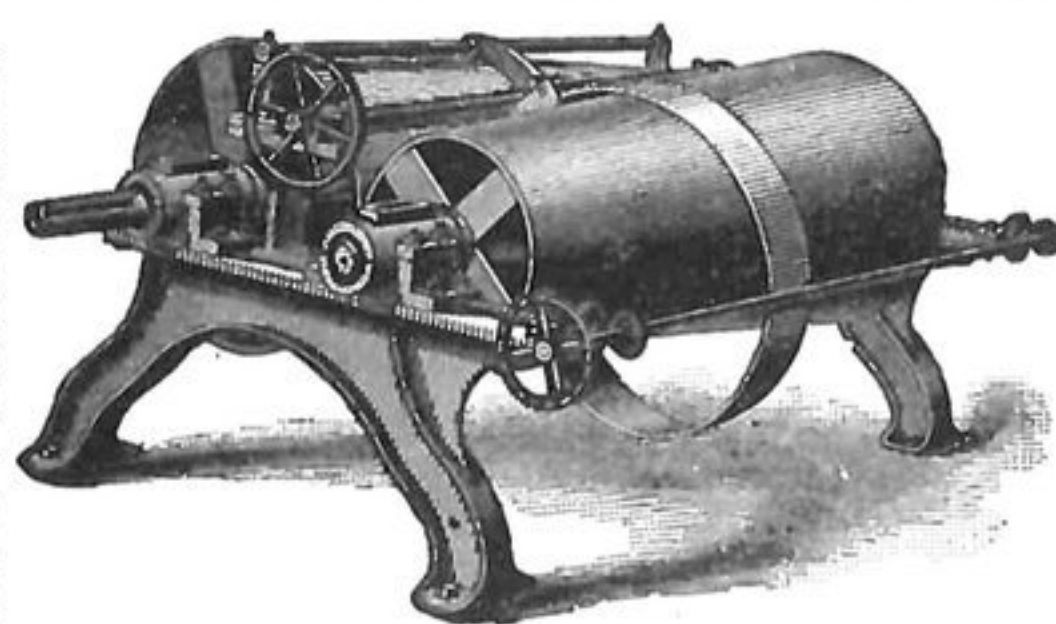
THE EVANS FRICTION CONE & FRICTIONAL GEARING

"PATENTED."



fluctuating. All sizes made from 1/2 Horse Power to 50 Horse Power.

This cut represents a set of hanging cone pulleys. This pattern is intended for that class of machinery that stops and starts at the same speed, and at the same time be able to change the speed more or less while running. These cones are also fitted with a governor where a steadymotion is required and the initial power is



SEND FOR ILLUSTRATED CATALOGUE.

EVANS FRICTION CONE CO., 85 Water St., BOSTON

EUROPEAN ECHOES.

IN order to promote the export of wheat and to empty the overfilled warehouses of Vienna, the directors of the Hungarian state railways have, with the government's approval, given up to the end of July some extra facilities in the export of wheat to Fiume for export. A reduction will be made in rail freights of 12 kreuzers per 224 pounds on shipments of not less than 50 car-loads destined for French or English ports.

SAYS the London "Millers' Gazette:" The Germ Defense Association has now been finally closed, we understand. Millers have answered the appeal for funds to defray the law costs in a very satisfactory manner, evidently considering that the Defense Association, by its action in defending the interests of millers, has saved them many thousands of pounds. It is nevertheless very satisfactory to be able to say that British and Irish millers are ready when called upon to contribute their share of the costs of a legal fight in their collective interests, of which fact intending claimants under milling patents will please take note.

DORNBUSCH states that the large deliveries of English wheat have attracted a good deal of attention, and the question arises, what becomes of it all? For, on account of inferior quality, millers can use only 30 to 50 per cent. of native grain, while last year many used nothing else. It is urged by some, who are in a position to know, that the increase is only apparent and not real, and arises from the zeal of the government inspectors, roused to action by the commission which sat a few months ago. In the west of England the crop undoubtedly was poor and disappointing, and the extreme eastern districts also suffered; but, on the other hand, the Midlands, Fens and the home counties reaped a considerable crop, sadly out of condition it must be admitted, but still the quantity was gathered and must be sold this season. Last week a lot of wheat was sold on Mark Lane weighing 63 pounds per bushel, and averaging 60 bushels to the acre. This was grown in Middlesex and was bought for shipment to Spain.

ACCORDING to a London letter dated February 16, the following shows the imports of cereal produce into the United Kingdom during the first twenty-four weeks of the season, compared with previous seasons:

| IMPORTS. | 1888-89. | 1887-88. | 1886-87. |
|----------------------|------------|------------|------------|
| Wheat.....cwt. | 29,520,423 | 23,226,489 | 23,656,026 |
| Barley.....cwt. | 10,725,427 | 9,686,316 | 10,322,374 |
| Oats.....cwt. | 8,351,111 | 8,399,124 | 7,236,886 |
| Peas.....cwt. | 1,020,059 | 1,751,014 | 1,167,506 |
| Beans.....cwt. | 1,389,974 | 1,262,491 | 1,200,327 |
| Indian corn.....cwt. | 11,696,508 | 10,770,300 | 12,183,302 |
| Flour.....cwt. | 7,148,539 | 8,967,065 | 8,671,033 |

Supplies available for consumption, exclusive of stocks on September 1:

| IMPORTS. | 1888-89. | 1887-88. | 1886-87. |
|-----------------------|------------|------------|------------|
| Wheat.....cwt. | 29,520,423 | 23,226,489 | 23,656,026 |
| Flour.....cwt. | 7,148,539 | 8,967,065 | 8,671,033 |
| Sales, h'm-gr'n..... | 17,490,426 | 20,654,148 | 27,138,850 |
| Total..... | 54,159,388 | 52,847,702 | 49,465,909 |
| WHEAT. | 1888-89. | 1887-88. | 1886-87. |
| Av. price.....week.. | 29s 7d | 30s 5d | 33s 6d |
| Av. price.....season. | 32s 0d | 30s 2d | 32s 6d |

SAYS the London "Miller" of February 25: The issue on Tuesday of the Government produce-estimates endorsed the opinions of those who reckoned that the last wheat crop was an average. But not all the government horses and men can set up an optimistic view as a general belief in respect to the past most ungenial season. The bushel may be filled with harvest produce of some sort, but it is not filled with good wheat. At least, this assertion may be made without reserve if we judge from the universal verdict of country millers, who find themselves compelled to buy and mix with native much more foreign wheat than usual. In very few seasons, indeed, has the grist contained so large a proportion of imported wheat as it does at present in every English

county. The opinion has been given that country millers buy less foreign flour than they were expected to take, simply because they have to buy wheat for mixing with farmers' samples and therefore can forego buying flour for mixing. Anyhow, the publication of the official produce-statistics has not convinced practical men, millers, merchants and farmers, that the wheat harvest of 1888 was an average one even in yield.

SAYS the London "Millers' Gazette:" The Austrian consul-general at Liverpool has lately sent a report to his government concerning mills and milling in England. He reports that there are about 7,000 flour-mills, of a total collective capacity of 36,000,000 sacks of 280 pounds; that is to say, more than the annual consumption of the country, which is estimated at 34,000,000 to 35,000,000 sacks. He adds that the capacity of individual mills varies from 100 to 7,000 sacks per week, and that, although the roller system is making more and more headway, a great number of stone mills still exist. We believe that the consul's estimate of the number of flour-mills in the United Kingdom is much too high; indeed, it is doubtful whether there are more than 4,000 in the country, not more than 3,000 are at this moment at work, with capacities of 500 sacks per week and more. Previous estimates with regard to the number of mills in the country, which 10 years ago was assumed to be 10,000, have all been greatly exaggerated, including as they have a large number of persons who call themselves "millers" in the county directories, but who did not manufacture a single sack of flour; they simply sold it in retail. The same estimates, moreover, comprised hundreds of oatmeal mills, grist-mills, etc., which would hardly come under the category of flour-mills.

COTEMPORARY COMMENT.

Many operators seem to look upon the rail movement of Washington Territory wheat across the continent as a possibly disturbing factor in the market. The fact is, the wheat is not deliverable on Chicago contracts, no provision having been made under the rules for the admission of Pacific coast white wheat into the contract grade.—*Chicago Daily Business.*

With the glut of flour removed from the markets and prices regulated by common-sense action on the part of the merchant millers, think what a handsome business can be done with a good short-system mill! The prospect is almost too delightful to think of.—*Modern Miller.*

The mill engineer who would operate independent of all mill-furnishers, as far as particular interest with them is concerned, has failed to materialize.—*Millstone.*

The people who announced that the wagon would soon commence to move up to the \$1.50 mark for wheat have not yet redeemed their promises. The wagon started all right, but at the present time seems to have got pretty badly mired.—*American Miller.*

A result of the continued low prices of corn has been that more live stock is being fed in northern Iowa during the season of 1889 than ever before. Only a small portion of Iowa's immense crop of this cereal is being shipped, the larger share of it being converted into beef and pork.—*Minneapolis Market Record.*

MILLING PATENTS.

Among the patents granted March 5, 1889, are following: Wm. R. Burrage, Toronto, Ontario, No. 398,817, a bag-holder.

John A. Demuth, Toledo, O., No. 398,821, a tallying apparatus for grain-hoppers.

Wm. T. McCloskey, Westport, Pa., No. 398,842, a mill-pond waste-water gate.

H. A. Barnard, Moline, Ill., No. 398,999, a flour-packer.

John A. Krake, Buffalo, N. Y., No. 399,148, grain-separator.

Wm. S. Scott, Eminence, Ind., No. 399,164, an automatic grain weigher and measurer.

James Dawson, Harrisburg, Pa., No. 399,186, a roller-mill, one-half assigned to John H. Dawson, same place, and No. 399,187, a feed-regulator, similarly assigned.



RELIANCE OIL & GREASE CO., CLEVELAND, O.,

—MANUFACTURERS OF—

Finest Lubricants for Milling Plants. A Challenge to the World.

WRITE US.

"VALVE OLEINE"—675 Degrees Fire Test, Cylinder Oil.

"RUSSIAN"—Engine and Machine Oil.

"CHIEF"—Roller Mill Lubricant.

"ANCHOR"—Roller Mill Grease.

"NIAGARA"—Belt Grease.

"CHELSEA"—Scale Solvent, Best on Market.

Agents Wanted.

FREE—SAMPLES, CATALOGUE, AND ALL INFORMATION.

SPECIAL
HIGH GRADE
PRODUCTS



**MOORE'S
PATENT
BARREL HEATER.**

For all kinds of coo-
page. Thousands
in use in all parts of the
U. S. Send for Circular.

JOLIET STOVE WORKS JOLIET ILL.



STANDARD SCIENTIFIC BOOKS.

THE PUMP CATECHISM—By Robert Grimshaw, M. E. A Practical Help to Runners, and Makers of Pumps of any kind. Just out. In cloth, one volume. Price postpaid. . . . \$1.00

A TREATISE ON FRICTION AND LOST WORK IN MACHINERY AND MILL WORK—By Robt. H. Thurston. Containing an explanation of the Theory of Friction and an account of the various lubricants in general use, with a record of various experiments to deduce the laws of Friction and Lubricated Surfaces. Copiously illustrated. 8 vo., cloth. . . \$3.00

KNIGHT'S MECHANICAL DICTIONARY—By Edward H. Knight, A.M., L.L.D. A book for all persons who make, buy, sell, use or want to know anything about tools or machines, now complete in four volumes, bringing the record down to this time. Sheep; 4 volumes. . . \$31.50

THE AMERICAN HOUSE CARPENTER—By R. G. Hatfield, (1880). A Treatise on the art of Building, comprising styles of architecture, strength of materials, theory and practice of construction of floors, framed girders, roof trusses, stairs, doors, windows, mouldings and cornices. Numerous fine wood engravings. 8 vo., cloth. . . . \$5.00

A MANUAL OF CATTLE FEEDING—By H. P. Armsby, Chemist of the Connecticut Agricultural Experiment Station. With plates; 12 mo., cloth. . . . \$2.50

A TREATISE ON TOOTHED GEARING—By Howard J. Cromwell. 12 mo., cloth. Complete Instructions for Designing, Drawing and Constructing pur Wheels, Bevel Wheels, Lantern Gear, Screw Gear, Etc. . . . \$2.00

STEAM ENGINE CATECHISM—By Robert Grimshaw. A Series of thoroughly practical questions and answers arranged so as to give to a young engineer just the information required to fit him for properly running an engine. 18 mo., cloth. . . . \$1.00

THE WINDMILL AS A PRIME MOVER—By A. R. Wolff, M. E. Comprehending everything of value relating to windmills, their use, designs, construction, etc. With many fine illustrations. 8 vo., cloth. . . . \$3.00

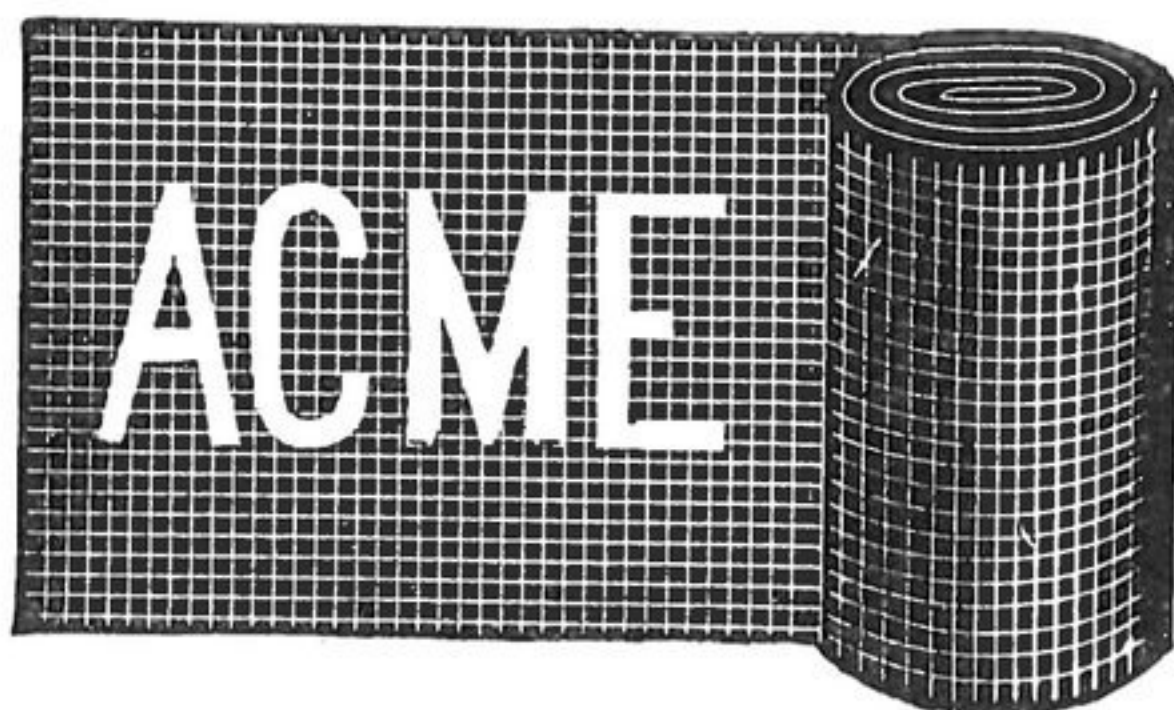
BOOKKEEPING & ACCOUNTANTSHIP—By Thomas Jones. For self-instruction or office reference. Based on twenty years experience in teaching. 8 vo., cloth. . . . \$2.50

THE ARCHITECT AND BUILDERS POCKET-BOOK—By F. E. Kidder. With original tables and valuable information for architects, builders, engineers and contractors. Fully illustrated. In Pocket-Book form. Morocco. . . . \$3.50

Any book extant at lowest prices. Great inducements to parties collecting libraries.

McFAUL & NOLAN, BUFFALO N. Y.

WIRE BOLTING CLOTH—STEEL, BRASS & TINNED



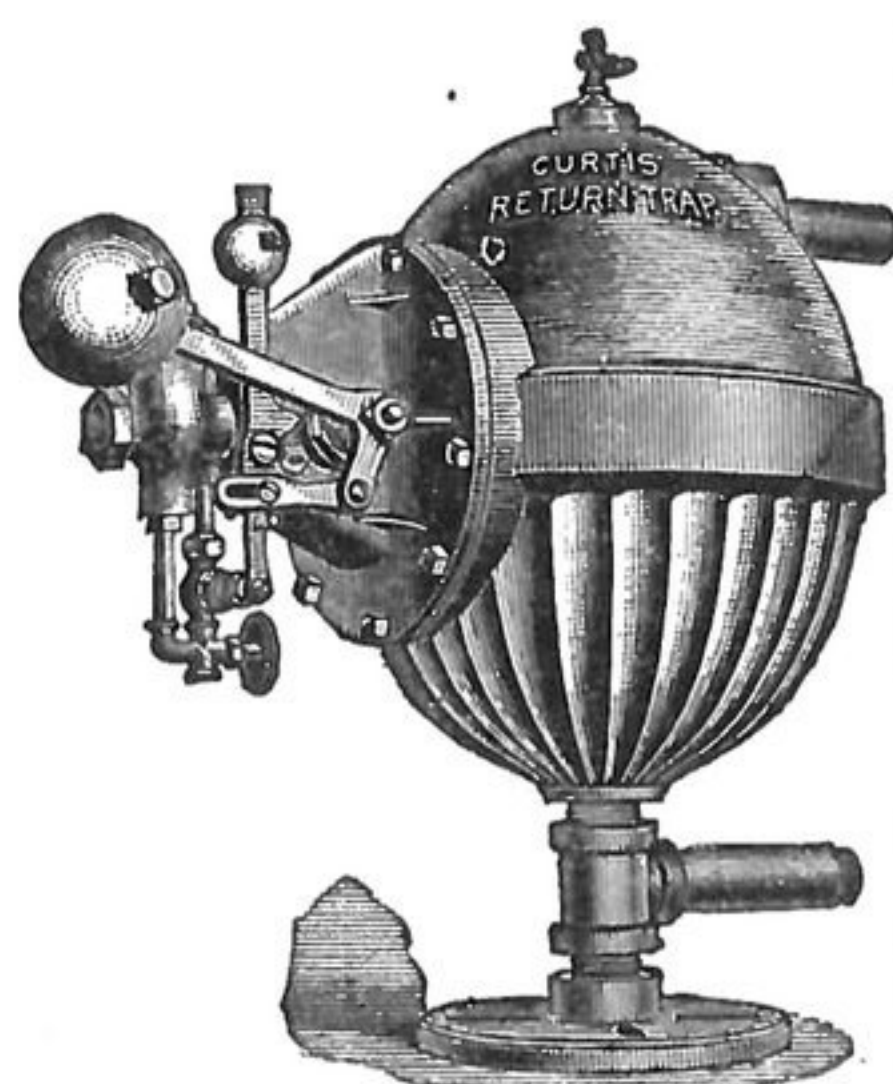
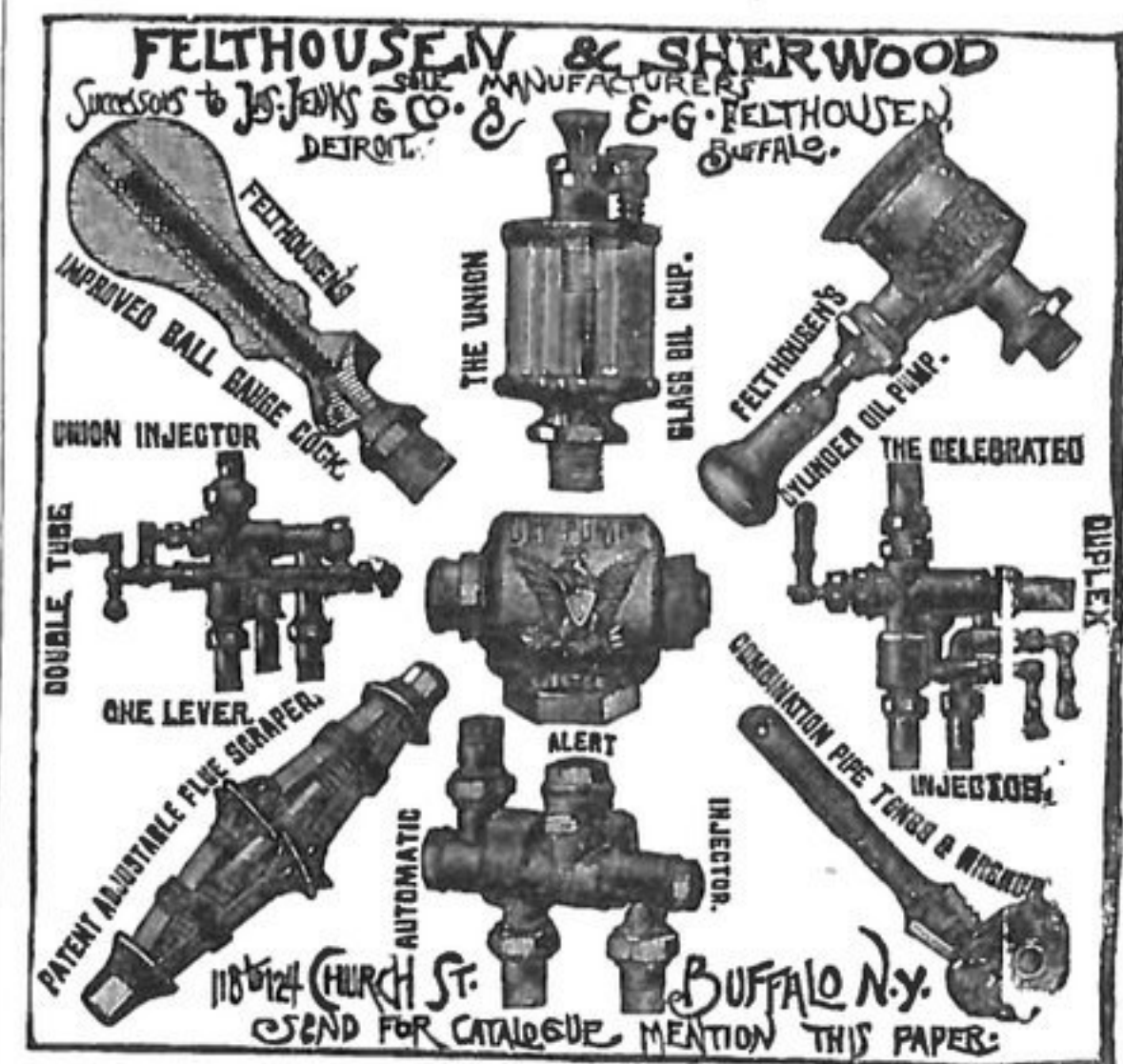
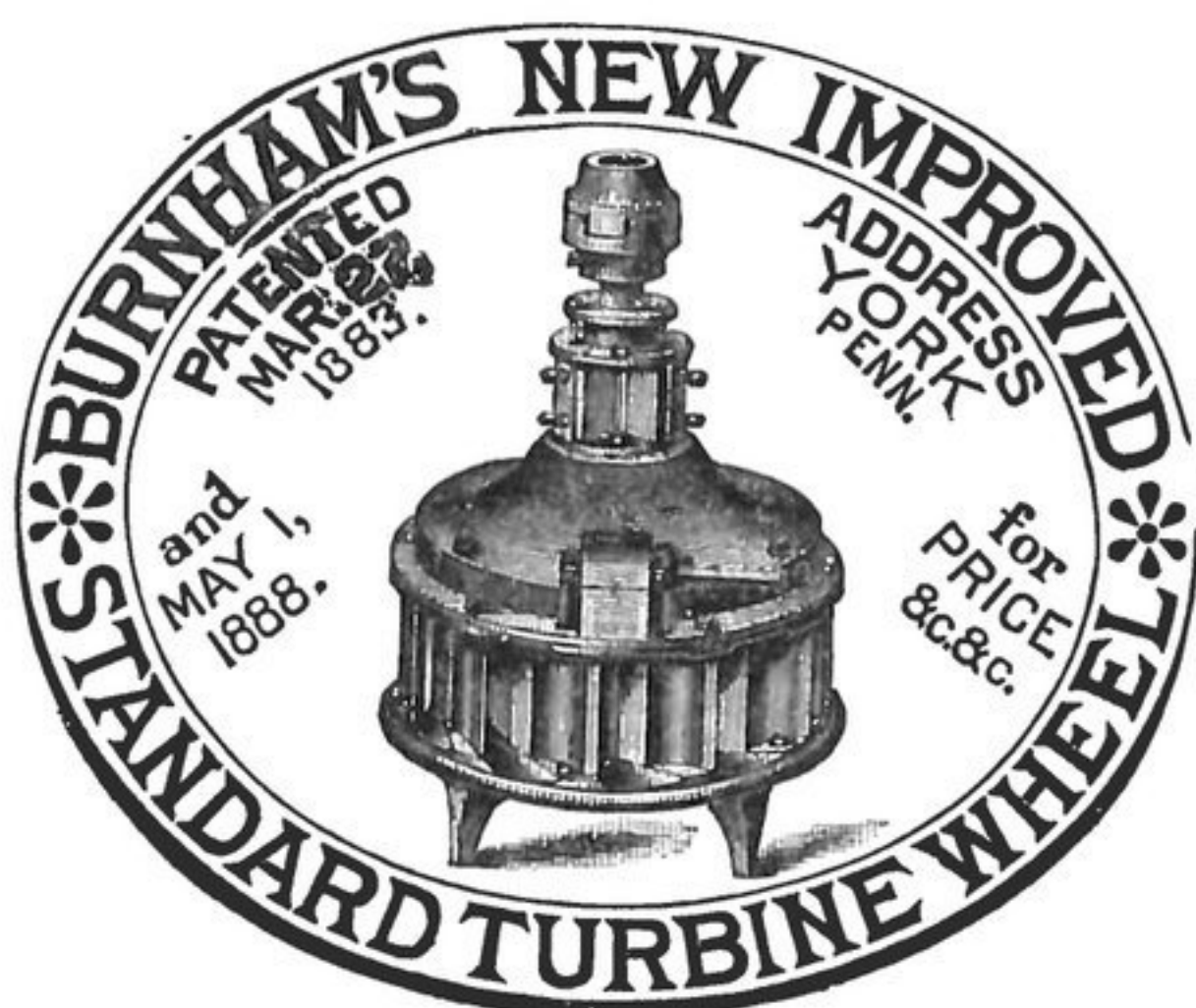
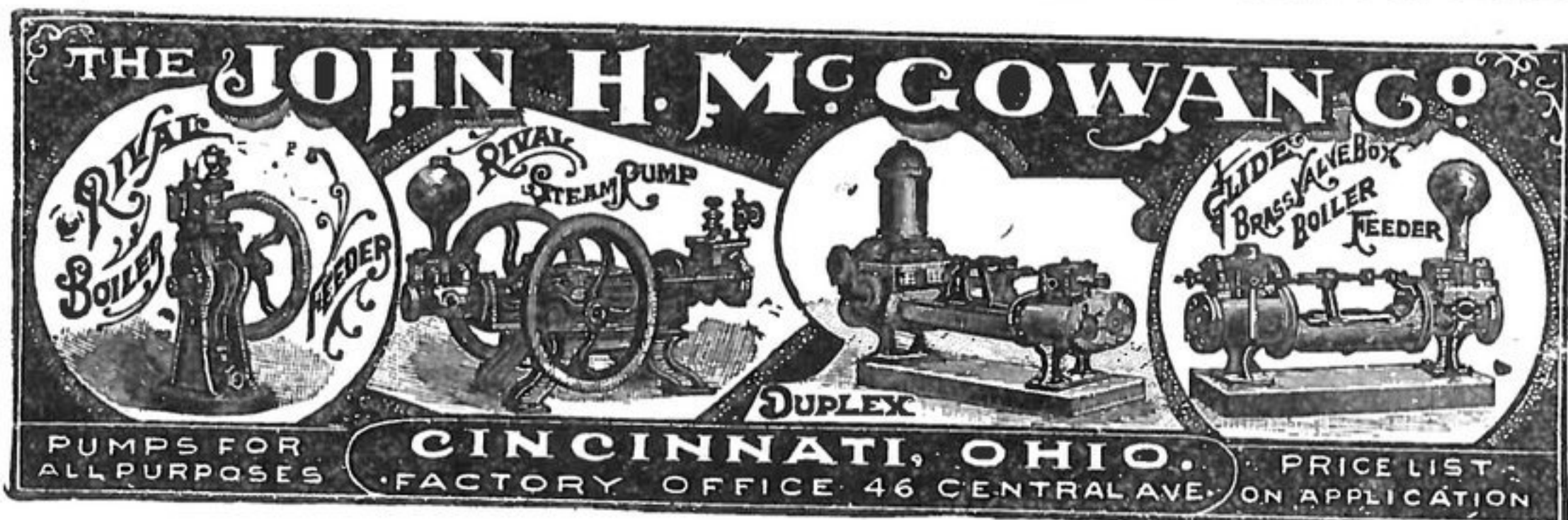
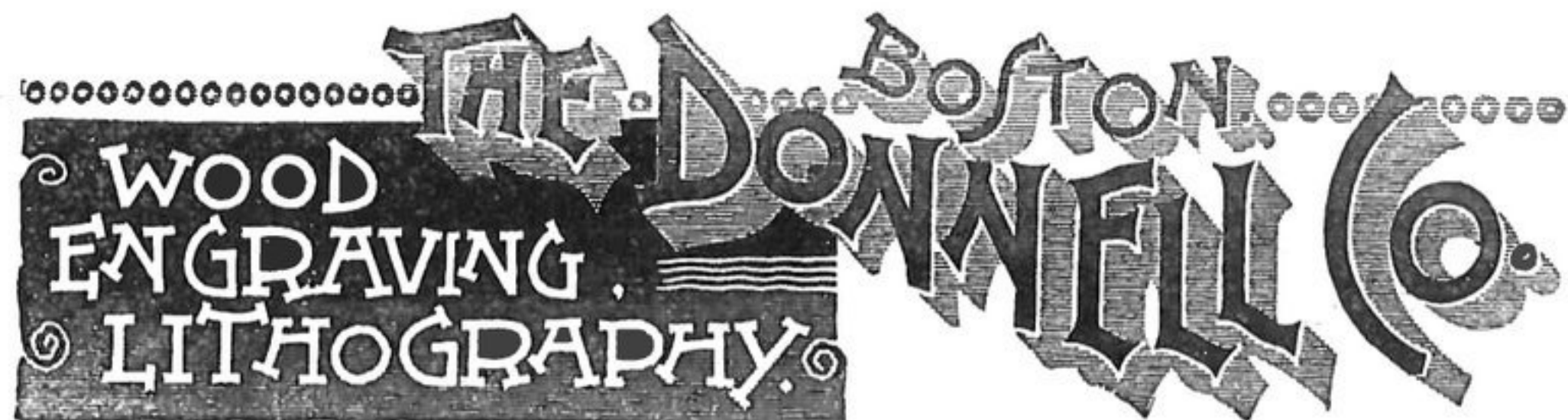
—[ESTABLISHED 1844]—
Exclusive Manufacturers of the
**"ACME" STEEL TEMPERED
BATTERY & BOLTING WIRE CLOTH.**

Also manufacturers of Bran Duster Cloth, Plated Wire Mill Screen Cloth, Smut Cloth, Brass and Copper Wire Cloth. A full line constantly on hand. Send for samples and price lists.

Brooklyn Wire Cloth Works.

NO. 107 JOHN STREET, NEW YORK.

CLOTHS MADE UP WITH PATENT BINDING WHEN DESIRED.



THE CURTIS PATENT RETURN STEAM TRAP.

It is noiseless, positive, rapid, will return all condensation back into the boiler, and works equally well in connection with reduced pressure or exhaust steam, also when the return is below the water line of the boiler.

**THE CURTIS REGULATOR COMPANY,
No. 74 BEVERLY ST., BOSTON, MASS.**

GENERAL AGENCIES.

NEW YORK, 109 Liberty st.

CHICAGO, 218 Lake st.

PHILADELPHIA, 2035 N. Front st.

ST. LOUIS, 707 Market st.

MINNEAPOLIS, 210 S. Third st.

NEW ORLEANS, 21 Union st.



OFFICE OF THE MILLING WORLD,
BUFFALO, N. Y., March 16, 1889.

On Friday of last week better crop reports, lower cables and western rate cutting made the markets lower and less active. March wheat closed at 95½c and June at 98c. in New York. Options 2,300,000 bushels. In Chicago March closed at 99¼c. and May at \$2.02½. March corn closed at 44½c. and oats at 31¼c. Wheat flour ruled dull and quiet and generally unchanged. Some export deals were recorded, mostly in high-grade Southern for the English market. The other lines were featureless.

Saturday treated the speculators to a heavy break in wheat in Chicago, where March sold from 99¼c to 96½c., April from \$1.01¼ to 97½c., May from \$1.02½ to 99½c. and June from 99½c. at closing. The break was caused by heavy selling by big operators, led by Hutchinson and followed by a multitude of longs. In New York the decline was about 1c. all along the months. Options 1,000,000 bushels. March corn ruled at 44½c. and oats at 31¼c. Wheat flour was exceedingly dull, the break in wheat driving the jobbers entirely out of the market. Exporters were looking for low-grade springs, mainly fine, superfine and bakers' extras for the United Kingdom. The minor lines were featureless.

On Monday the irregularity of the markets continued. In New York March wheat closed at 93½c. and May at 95½c. Options 5,500,000 bushels. Exporters took several loads for Lisbon. In Chicago March wheat closed at 96¼c., April at 97½c. and May at 99¼c. March corn closed at 44c. and oats at 31¼c. Wheat flour was dull and in buyers' favor, with exporters offering lower prices than those of the previous week for England. Trade was small. The minor lines were quiet.

On Tuesday there was enormous liquidation in wheat in New York and Chicago, causing the markets to weaken perceptibly. It was thought that the Chicago clique was "out," as their May contract wheat was "rung out" freely. In New York March wheat closed at 92½c., April at 93½c., May at 94½c. and June at 95½c. Option 13,000,000, principally May. In Chicago March closed at 93½c., April at 94½c. and May at 95½c. March corn closed at 43½c. and oats at 31c. European cables kept wheat below even the price to which it sank, and no export followed the flurry. Wheat flour was dull, weak and lower, with no orders in any line. Springs suffered more by the break than winters, as the latter is in small supply. The visible supply in the United States and Canada was as follows:

| | 1889. | 1888. | 1887. |
|-------------|------------|------------|------------|
| | March 9. | March 10. | March 12. |
| Wheat..... | 31,780,157 | 36,662,387 | 54,267,280 |
| Corn..... | 16,911,625 | 9,202,103 | 15,523,523 |
| Oats..... | 7,741,338 | 4,426,319 | 4,346,340 |
| Rye..... | 1,641,019 | 378,299 | 399,044 |
| Barley..... | 1,712,138 | 2,235,323 | 1,725,955 |

On Wednesday the markets were generally unsettled, with wheat slightly firmer. March wheat closed in New York at 92¾ and June at 95½c. Options 5,750,000 bushels. In Chicago March closed at 95c. and May at 97¼c. March corn closed at 44c. and oats at 31c. Wheat flour was dull but firm, with holders refusing to give concessions and with buyers holding off in hope of further reductions in wheat to drag down flour. Sales were small. The minor lines were quiet and featureless. The situation in Chicago remained mysterious. It was thought that the Fairbank interest in May wheat had been transferred to July, as that month remained steady under all the excitement over May.

On Thursday the markets were quiet and

featureless all around. March wheat opened in New York at 92¾c. and closed at 92½c. Options 6,000,000 bushels. In Chicago May wheat closed at 96c. March corn opened at 44c. and closed at 43½c., and oats ruled at 30½c. Buckwheat grain was steady at 50c., with very light sales. Rye was steady at 54@55c. for State and Jersey, 57c. in elevator for No. 1, and 58c. afloat for State. Barley was slow at 70c. for 2-rowed State, 70@80c. for Canada, 72@75c. for 6-rowed. Malt was in fair demand at \$1@1.10 for the whole range of Canada, 90c. for 2-rowed, and 92@95c. for 6-rowed. Mill-feed was slow at the following quotations: 40, 60 and 80-lb, 65@70c; 100-lb, 80@90c; sharps, 90@95c; rye, 80@85; screenings 50@80c; oil meal, \$1.45@1.50; cotton meal, \$1.25@1.28; barley meal, 90c. nominally.

Wheat flour was neglected, with buyers holding off and sellers not pressing for business. The quotations were as follows:

| SPRING FLOUR. | | |
|------------------|-------------|-------------|
| | Sacks. | Barrels. |
| No grade..... | \$1.80@2.05 | \$....@.... |
| Fine..... | 2.05@2.30 | 2.40@2.70 |
| Superfine..... | 2.55@3.00 | 3.10@3.25 |
| Extra No. 2..... | 3.20@3.35 | 3.35@3.55 |
| Extra No. 1..... | 3.60@4.20 | 3.70@4.20 |
| Clear..... | 3.80@4.70 | 4.35@4.85 |
| Straight..... | 5.10@5.60 | 5.60@5.85 |
| Patent..... | 5.70@6.35 | 6.20@6.75 |

| WINTER FLOUR. | | |
|------------------|-------------|-------------|
| | Sacks. | Barrels. |
| No grade..... | \$2.80@2.15 | \$....@.... |
| Fine..... | 2.50@2.75 | 2.70@2.90 |
| Superfine..... | 3.00@3.15 | 3.20@3.35 |
| Extra No. 2..... | 3.30@3.45 | 3.60@3.80 |
| Extra No. 1..... | 3.70@4.80 | 5.05@5.55 |
| Clear..... | 4.25@4.65 | 4.55@4.95 |
| Straight..... | 5.05@5.25 | 5.05@5.55 |
| Patent..... | 5.20@5.55 | 5.35@6.00 |

| CITY MILLS. | | |
|-------------------|-------------|--|
| W. I. grades..... | \$4.85@5.00 | |
| Low grades..... | 2.20@2.60 | |
| Patents..... | 5.75@6.45 | |

Buckwheat flour was \$1.40@1.60. Rye flour was dull at \$2.90@3.10. Corn products were quoted as follows: Coarse at 80@85c; fine yellow, 05@1.05; fine white, \$1.05@1.10; Brandywine and Sagamore, \$2.90; Southern and Western, \$2.75@2.85; coarse meal, 80@85c; fine yellow, 98@1.00; fine white, \$1.03@1.05; Southern, 85@1.20 for coarse and fine in bags; grits \$2.50@2.60.

BUFFALO MARKETS.

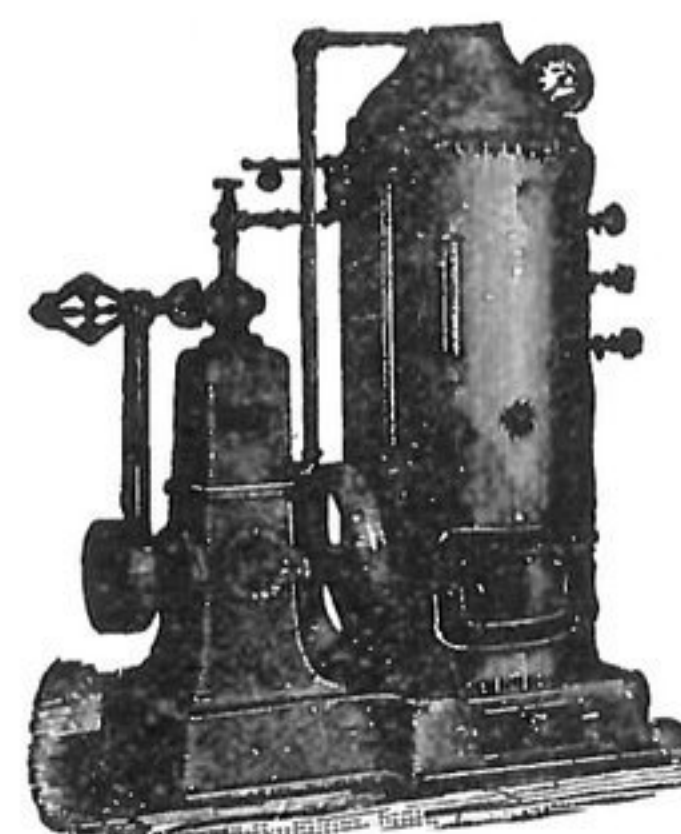
FLOUR—City ground—Patent spring, \$7.25@7.50; straight Duluth spring, \$6.50@6.75; bakers' spring, best, \$6.00@6.25; do rye mixture \$5.25@5.50; patent winter \$7.00@7.25; straight winter \$5.75@6.00; clear winter \$5.50@5.75; cracker \$5.50@5.75; graham \$5.50@5.75; low grade \$3.00@4.25; rye 3.50@3.75 per bbl; buckwheat \$2.50 per cwt. OATMEAL—Akron \$8.00; Western \$5.75 per bbl; rolled oats in cases, 72 lbs, \$3.25. CORNMEAL—Coarse, 80c.; fine 85c.; granulated \$1.50 per cwt. WHEAT—Chicago May opened at 97½c, advanced to 97½c, declined to 96¼c, and closed at 97c, a decline of ½c from the closing price on Wednesday. The limit for old hard was advanced to 81c; new, 22¾c; No. 1 Northern, 10c, and No. 2 Northern 5c Chicago May. The only sales of old hard reported were 500 bu \$1.27½; 600 bu do at \$1.27½, and 500 bu do at \$1.26½; also one carload No. 1 Northern at \$1.07½, old No. 1 hard closed at \$1.28, new at \$1.19½, No. 1 Northern at \$1.07, and No. 2 do at \$1.02. The limit for winter wheat was 6c over Detroit, but the few sales made were shaded; 4,500 bu No. 3 red brought 84¼c, and 4 carloads No. 1 white \$1.06; No. 2 red closed at \$1.01½, and No. 1 white at \$1.06½. CORN—The Chicago market closed at 35½c, a decline of ¼c from the closing price on Wednesday. The market here was strong to ¼c better, with a good demand on light offerings; sales 3 carloads No. 3 at 87½c, to arrive, 12 do do at 38c, 4 do do 3 yellow at 38½c, and 1 do do at 38½c. OATS—Firm and in fair demand; sales 12 carloads No. 2 white at 31c; No. 3 white at 29¾c, No. 2 mixed, 29@29¾c; white State from wagons 34@35c. BARLEY—Dull and weak; sales 3,000 bu No. 3 at 60c, and 3,000 bu No. 3 extra at 66c; No. 1 offered at 75c, No. 2 at 70c, and No. 2 at 60@63c. RYE—No. 2 Western dull at 53c. RAILROAD FREIGHTS.—To New York, Baltimore and Philadelphia rate points on grain flour, and feed, 18c. per 100 lbs; to Albany and West Troy, 10½c; and to Boston, 15c.

The Government Signal Service Bureau issues the following crop and weather bulletin: "There is a deficiency of moisture in the wheat region of the central valleys. In Ohio, Indiana, Illinois and southern Michigan about 60 per cent. of the normal rainfall is reported. Throughout the central valleys and southern states the season is well advanced, and farm work is in progress in Minnesota and Dakota. Notwithstanding the deficiency of moisture in the winter-wheat region the reports indicate that the weather in this district has affected this crop favorably. In the spring wheat section the ground is reported in fine condition and sowing is in progress in Dakota and Nebraska."

A Minneapolis, Minn., dispatch dated March 13 says: The flour output last week was 97,000 barrels against 86,700 barrels the previous week and 113,000 barrels for the corresponding time in 1888. The heavy shrinkage in wheat values during the past week has had a bad effect on flour, and prices were on Monday lowered 20 cents per barrel, this applying more to patents than other grades. The advance in wheat yesterday is expected to give more strength. The direct exports for the week were 15,270 barrels, against 13,800 for the preceding week. There were 489,660 bushels of wheat received at Minneapolis for the week; shipments, wheat 266,650 bushels; flour 99,640 barrels.

Experiments in winter wheat seeding around Owatonna, Minn., have proved unsuccessful this year, the seed having been killed by the cold. Farmers will plant spring wheat in the same fields.

PREJUDICE is a thief and robs you of many good things in this age of phenomenal progress. It pays to investigate. Send for Illustrated Price List of Reliance Safety Water Columns. They Protect Life and Property. Save Repairs and Enforce Economy. Every Column Warranted. **Reliance Gauge Co., 831 Sheriff Street, Cleveland, O.**



**DURABLE,
ECONOMICAL,
NOISELESS
SELF-LUBRI-
CATING,
LOW-PRICED.**

One and two Cylinder Engines, with vertical or horizontal boilers, are running 2 years without using a wrench on them.

1 to 15 H. P.
SEND FOR CIRCULAR
TO

CASTLE ENGINE WORKS
INDIANAPOLIS, IND.



H. J. DEAL

Specialty Company.

Flour and Grain Testing Appliances,
Specialties for the Milling, Flour and
Grain Trades.

BUYRUS, O., U. S. A.

SPECIALTIES

**ILLUSTRATED FOLDER "T"
FOR THE HOLIDAYS.
NOW READY.**

Please write for a copy at once. Only mailed to customers and on application. This is the most complete and extensive list of specialties ever issued by us. Write at once and secure a copy.

THE H. J. DEAL SPECIALTY CO.
BUYRUS, OHIO, U. S. A.

INSURE IN THE TRADERS & TRAVELERS

Accident Company,
287 BROADWAY, NEW YORK.

BENEFITS.

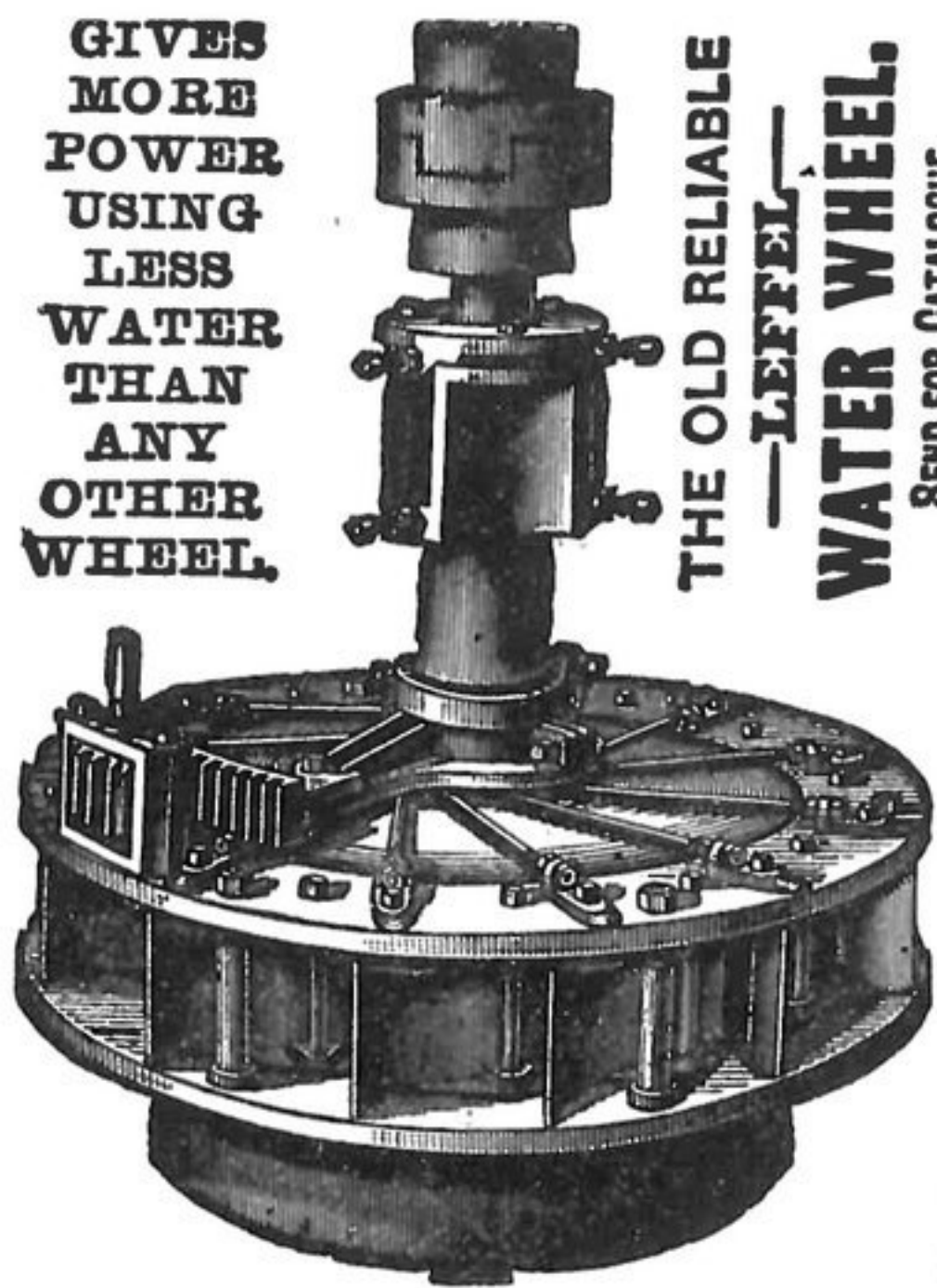
\$5,000 for Death.
\$5,000 Loss of Limbs.
\$2,500 Loss of Limb.
\$2,500 Loss of Sight.
\$1,250 Total Disability.
\$650 Loss of One Eye.
\$25 Weekly Indemnity for
26 Weeks.
One Set of Individual Registry Plates
Included.

COST.

Four Quarterly Payments, \$10.00
Annual Dues, - - - 1.00
Membership Fee, 5.00. \$11.00

IMPORTANT NOTICE.—The Traders & Travelers Accident Co. of New York desire the services of one responsible representative in each town to act as agent for the general transaction of their business. A liberal and permanent arrangement will be made with parties who can fill the above requirements. Address
C. S. SOMERVILLE, Sec'y.

GIVES
MORE
POWER
USING
LESS
WATER
THAN
ANY
OTHER
WHEEL.



THE OLD RELIABLE
—LEFFEL—

WATER WHEEL.

SEND FOR CATALOGUE.
JAMES LEFFEL & CO.
SPRINGFIELD, O., OR 110 LIBERTY ST., N.Y.

WHEN WRITING TO ADVERTIS-
ERS PLEASE MENTION "THE
MILLING WORLD."

THE "HARLOW" Positive Feed Lubricators.

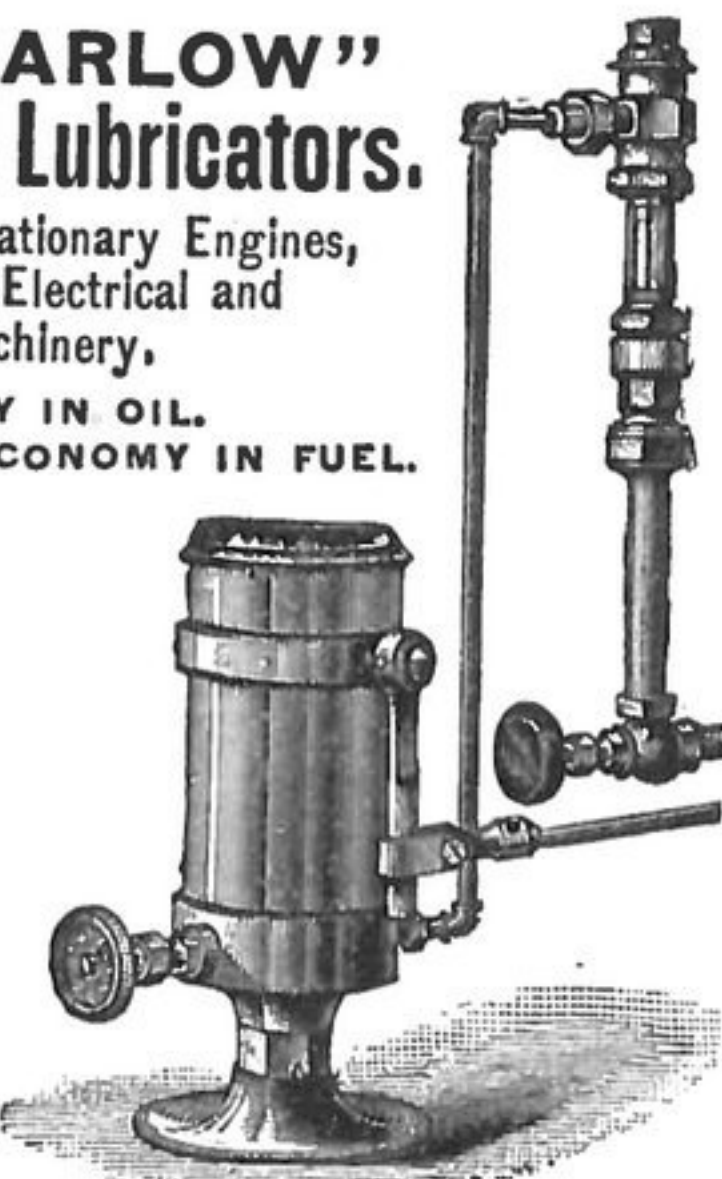
For Marine and Stationary Engines,
Steam Pumps, Electrical and
other Machinery.

MAXIMUM ECONOMY IN OIL.
MARKED ECONOMY IN FUEL.

Not dependent upon or
operated by Steam
Pressure, Condensa-
tion or Gravity.
Not affected by chan-
ges of temperature.

BEING operated by
some moving por-
tion of the engine or
machine to be lubri-
cated, the "Harlow
Lubricator" starts
and stops with the
engine or machine
being lubricated, without requiring the slightest atten-
tion from the engineer or operator, always delivering the
oil in any amount from a drop to a constant stream.
The cup can be filled at any moment while the engine
or machine being lubricated is in operation, without
causing any leakage either of oil or steam.

Harlow Lubricator Mfg. Co. BOSTON, Mass.
U. S. A.



THE BEST AND CHEAPEST CORN AND COB CRUSHER

IN THE WORLD.

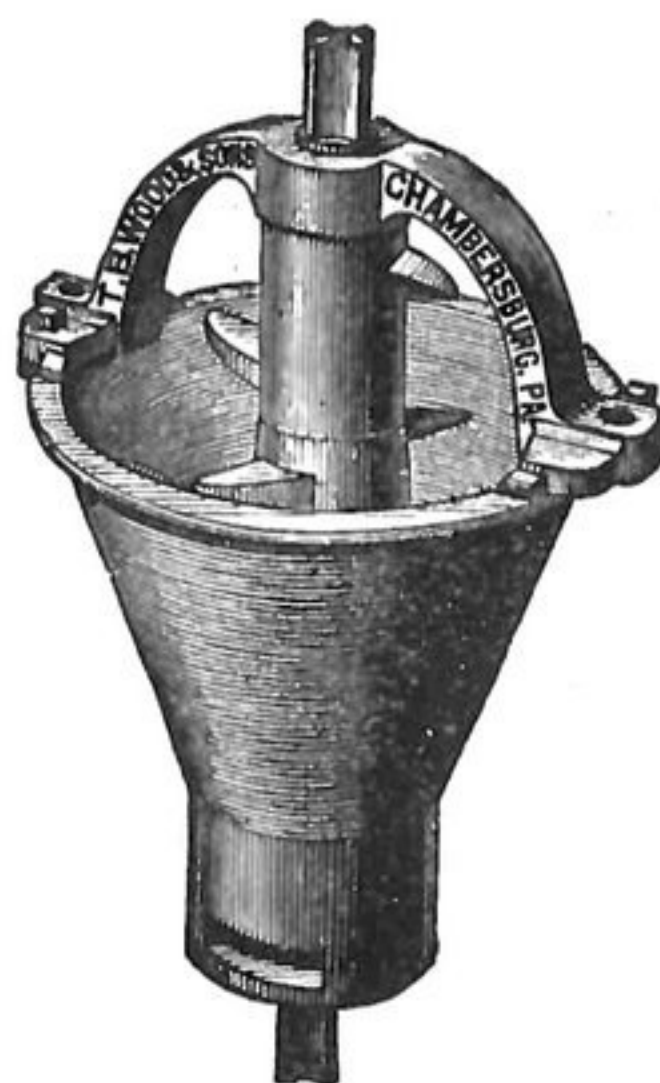
All wearing parts cast of a steel
mixture. Notice difference in con-
struction. Most area where most
work is done, where all other
crushers have least area where
most work is done. Low priced
machinery is not the cheapest, con-
sidering durability and efficiency.
Sent on 30 days' trial when satis-
factory reference is furnished.

Please Send for Circulars.

R. C. McCULLEY, LANCASTER, PENN.

\$15 Will Buy the Best and Cheapest
CORN AND COB CRUSHER

IN THE WORLD!



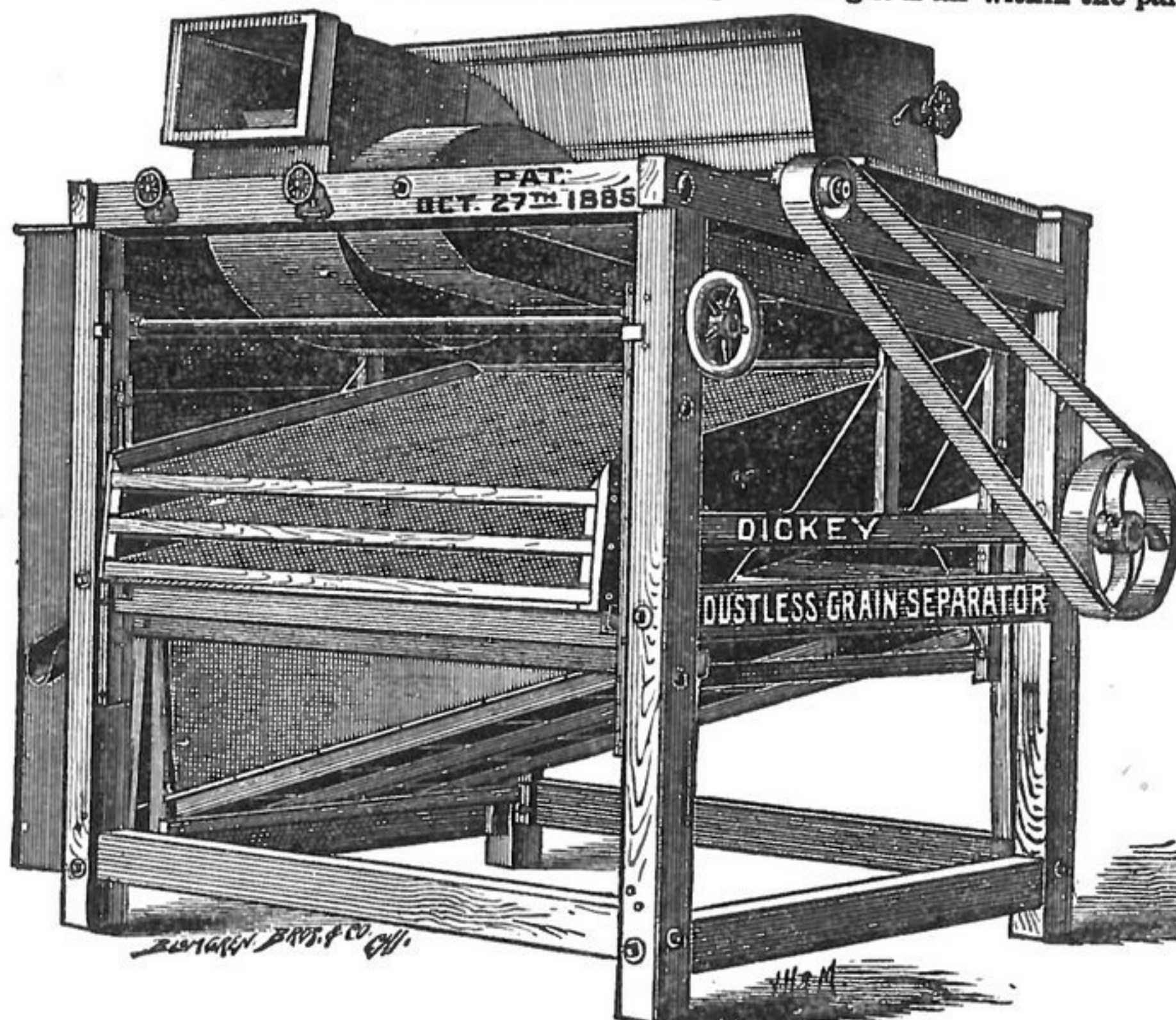
It can be driven either from above or below. Thousands of
these Crushers are now in use throughout the United States and
Canada, and are giving entire satisfaction. Send for circular,
giving testimonials from millers who are using our Crusher, and
know a good thing when they see it.

T. B. WOOD & SONS, CHAMBERSBURG, PA.

DICKEY DUSTLESS GRAIN AND FLAX SEPARATOR

This Separator is our latest and most perfect, and guaranteed to be the superior of any now on the market.
This machine, as can be seen by the cut, is not a warehouse fanning mill with one patent attachment, but is a
Dustless Separator, made for the express purpose of thoroughly cleaning and separating all kinds of grain in large
quantities; its construction is such that the working machinery and weight is all within the parts or anchors.

WE CLAIM FOR IT SUPERIORITY.



WE CLAIM FOR IT SUPERIORITY.

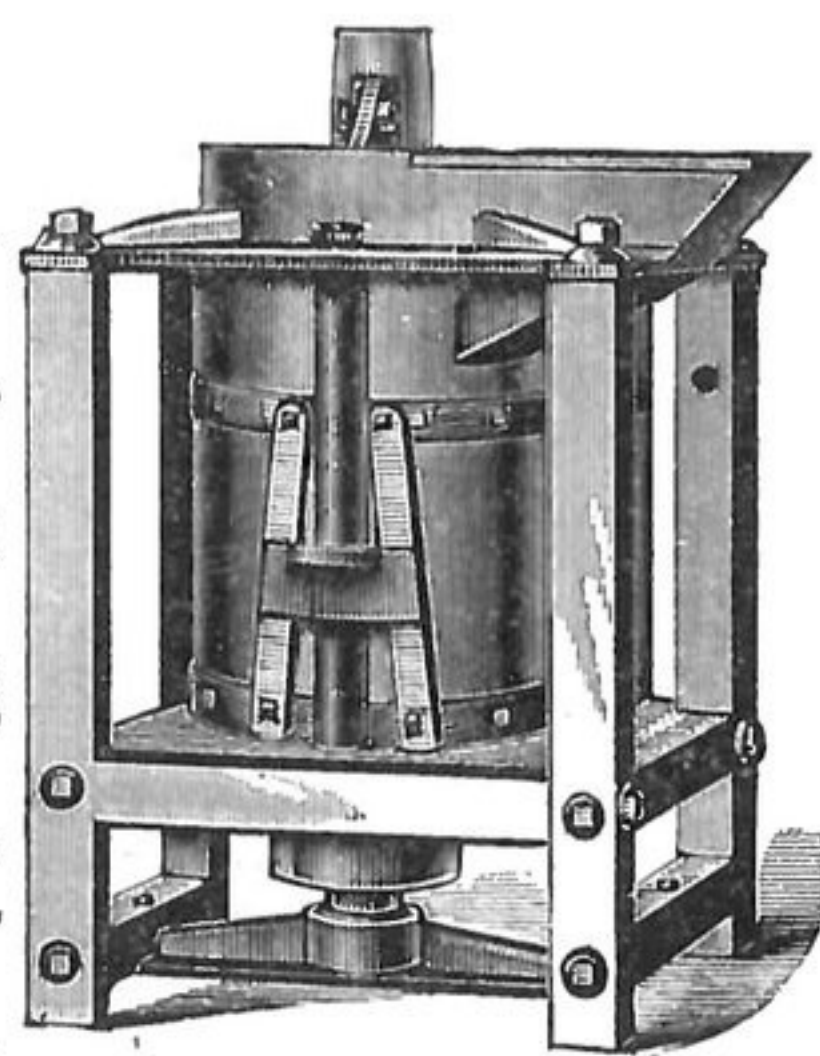
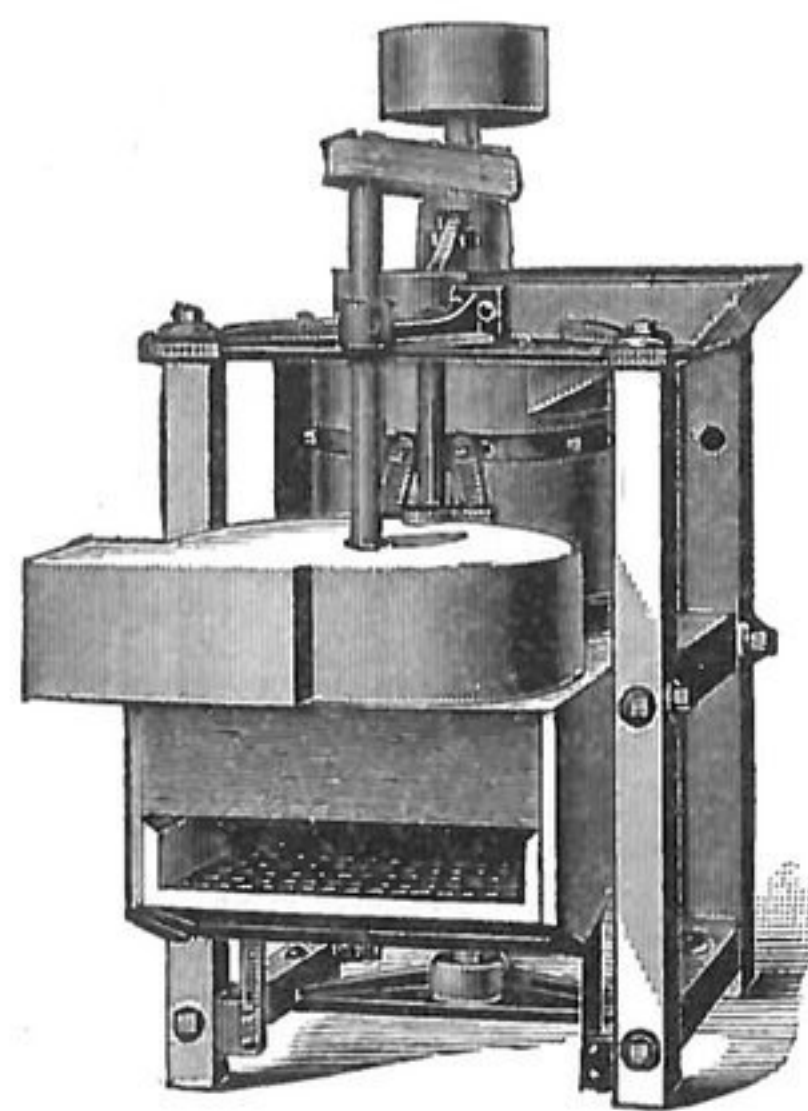
We claim for it Superiority over everything of the kind made, in simpleness, durability, saving of power, ca-
pacity and cost of construction. Its height will accommodate any number of spouts from different points, with-
out moving machine. They have a capacity from 700 to 1,500 bushels per hour. We also control exclusively the
manufacture of the celebrated Dickey Giant, End and Side Shake, Warehouse Mills, that have attained such a
world-wide reputation. Sent on approval to any reliable party. For full particulars address,

A. P. DICKEY MANUFACTURING CO. Successors to **Dickey & Pease, RACINE, WIS.**

The LIPPOLD DUSTLESS CORN SHELLER & CLEANER

MANUFACTURED BY

The LIPPOLD MFG. CO.
ERIE - - PENN.



THE HIGHEST CAPACITY for the LEAST MONEY.
The Best Machines for Mills and Elevators.
Machines Sent on Thirty Days' Trial.
SHELL UNHUSKED CORN AND CLEAN IT PERFECTLY.

WRITE FOR ILLUSTRATED CIRCULAR WITH PRICES.
NAME THIS PAPER.

"DE MAN WOT KNOWS IT ALL
is allus a-makin' change, a-
buyin' ob experience."

The man who does not think that
he "Knows it All" about

Pumps, Steam Engines and Boilers
Can find out a great deal about
them in

GRIMSHAW'S PUMP CATECHISM - \$1.00
STEAM ENGINE CATECHISM - - - 2.00
BOILER CATECHISM - - - - - 2.00
PREPARING FOR INDICATION - - 1.00

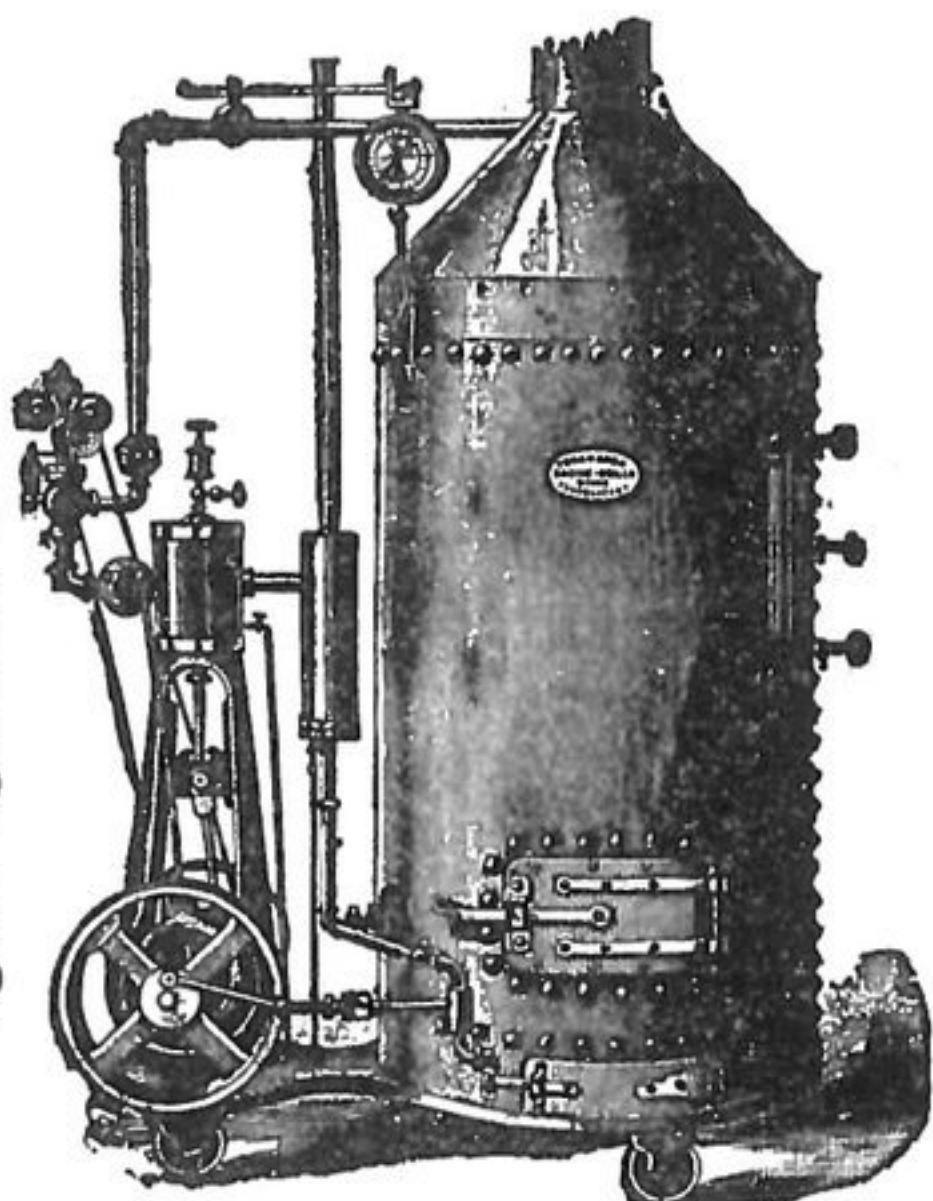
BY MAIL POSTPAID.

McFaul & Nolan, - Buffalo, N. Y.

TONAWANDA
ENGINE AND BOILER WORKS

A Large Assortment of Machinery.

The Best 6-Horse Power Semi-Portable Up-
right Engine and Boiler Made.



SPECIAL PRICE. GUARANTEED.

SEND FOR CATALOGUE.

ARMITAGE, HERSHEY & CO.
Tonawanda N. Y.

New Improved Patent Head Linings.



DESCRIPTION.

These Linings are curved edgewise and flatwise, be-
sides having the edge beveled, so as to make them fit
the head and chine PERFECTLY, without springing
them edgewise when nailing.

If you use them once you will have NO
OTHER. No need of pounding fingers, as
the ends do not have to be held down while
nailing. They are much more convenient
to nail and look better than any other.
They are first tied in bundles of two hun-
dred, and, when dry, are put into bales,
weighing about fifty pounds each, and tied
with two strong wires, to make them handle
better and to prevent loosing out in transit.

Write for prices and state about the num-
ber you use per year.

To convince you of their merit, and for
the purpose of introducing them, I will
ship a sample order of from five to ten
thousand at a REDUCED RATE.

SEND US A TRIAL ORDER. SATISFACTION
GUARANTEED.

J. H. PETERS,
Owner of Patent and Manufacturer,
COLEMAN, MICH.

* THE INK *
WITH WHICH THIS PAPER IS PRINTED
IS MADE BY THE
QUEEN CITY PRINTING INK CO.
CINCINNATI, O.

L. L. WHITLOCK,
Advertising Agent

FOR MANUFACTURERS.

TRADE JOURNALS A SPECIALTY.

P. O. DRAWER 5323. Boston, Mass.

As Agent for Advertisers instead of Papers, I obtain
the Best Rates Possible for my Customers.

Chemical Fire Extinguisher Co.

38 & 40 LASALLE STREET,

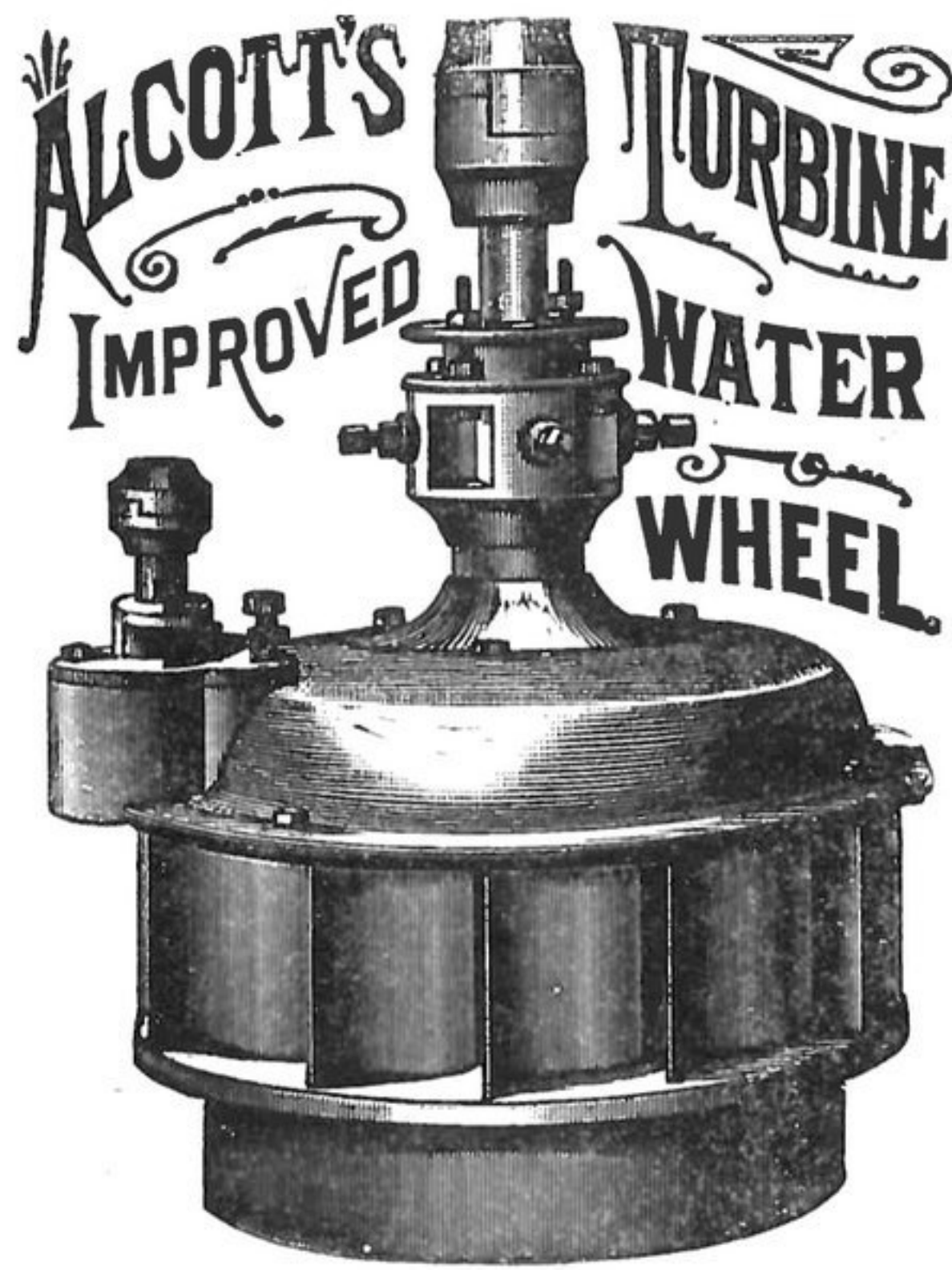
CHICAGO, - - ILL.

MANUFACTURERS OF THE

Only Chemical Automatic Fire Extinguisher Made.

No Freezing; No Corroding; No Leaking.
Cheapness and Absolute Reliability and Re-
duction in Cost of Insurance. We also manu-
facture everything in the line of Chemical Ex-
tinguishers, from a full 100 gallon engine to a
quart Hand Fire Extinguisher, of the best
and most approved kind. One gallon of our
chemical is equal to 500 gallons of water.

SEND FOR ILLUSTRATED CATALOGUE.



THIS WHEEL GIVES HIGH RESULTS, AND
IS ACKNOWLEDGED THE BEST, MOST PRAC-
TICAL AND EFFICIENT TURBINE MADE.
FOR SIMPLICITY, DURABILITY, AND
TIGHTNESS OF GATE IT HAS NO EQUAL.

State requirements and send for Catalogue to

T. C. ALCOTT & SON,
MOUNT HOLLY, N. J.



Made of sheet steel, with heavy band.

BOSS & ELEVATOR & BUCKETS.

If you are interested ask for Prices. Manufactured only by

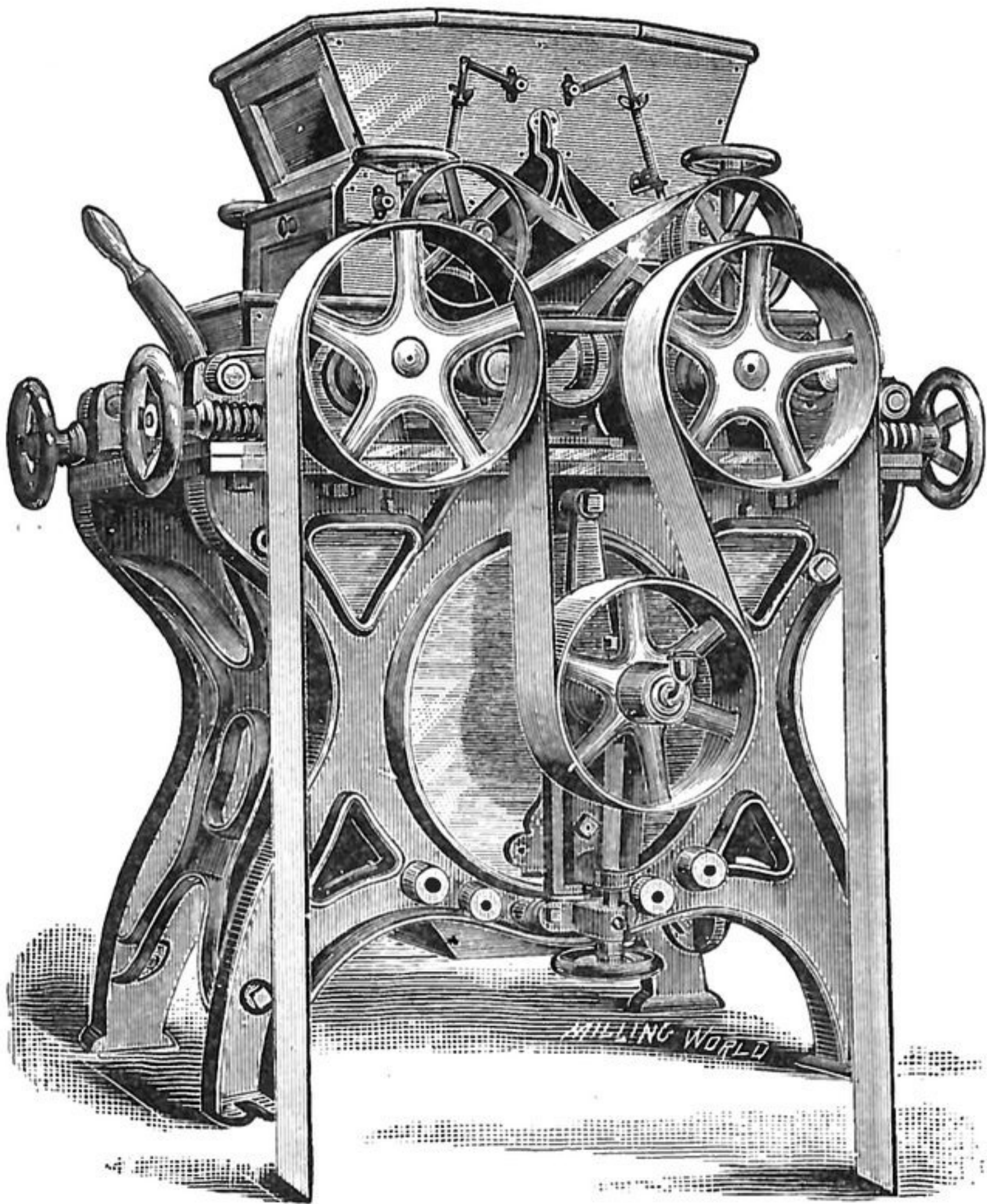
W. P. MYER, INDIANAPOLIS, IND.

16, 18 AND 20 EAST SOUTH STREET.



Made of tinned steel plate, with iron band.

JOHN HUTCHISON MFG. CO., Mill Builders and Mill Furnishers.



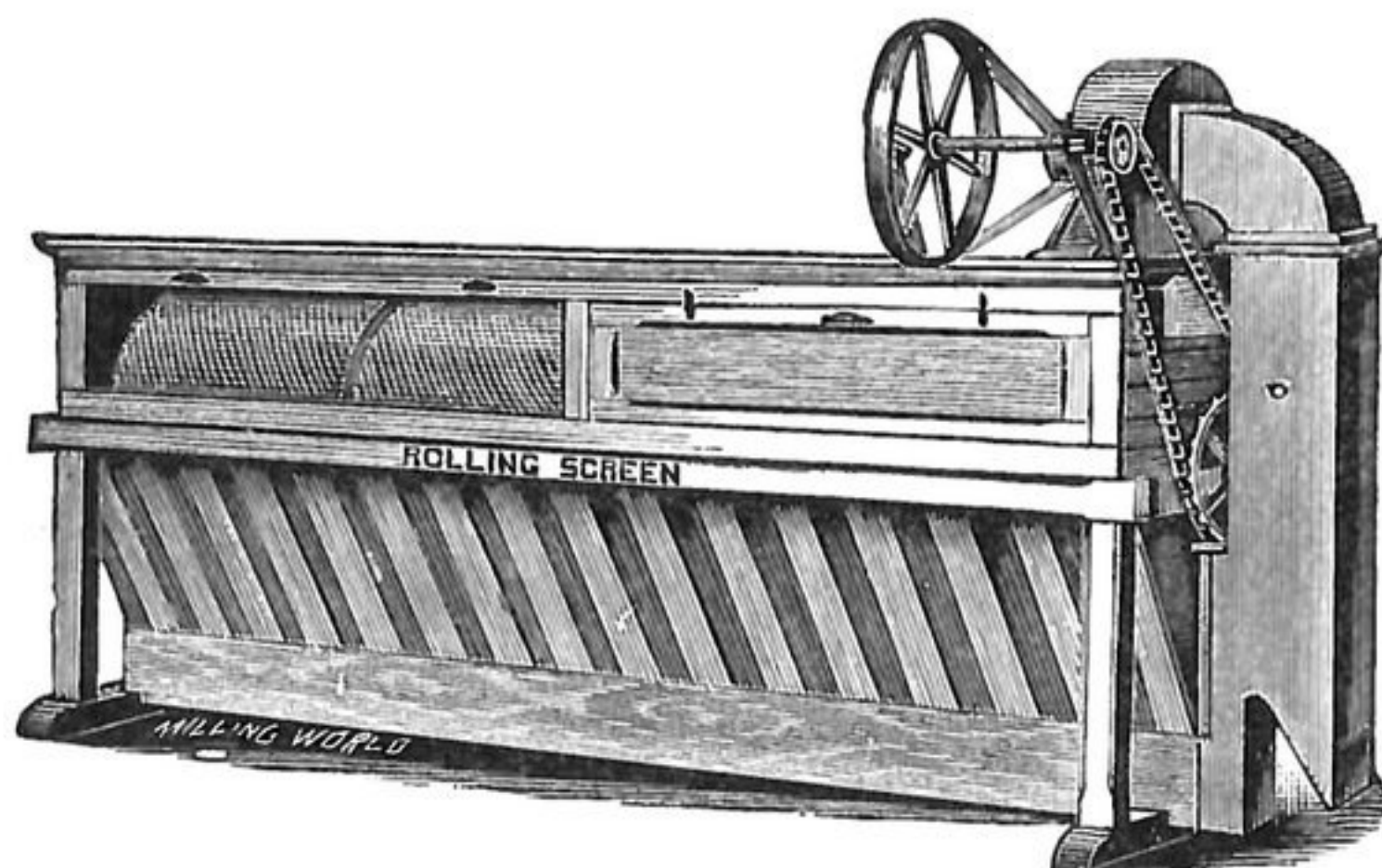
"The Rickerson." The original six inch 4 Roller Mill. We now own the patents on this mill and after greatly improving the mill manufacture them in four sizes:

6x12 inch.

6x18 inch.

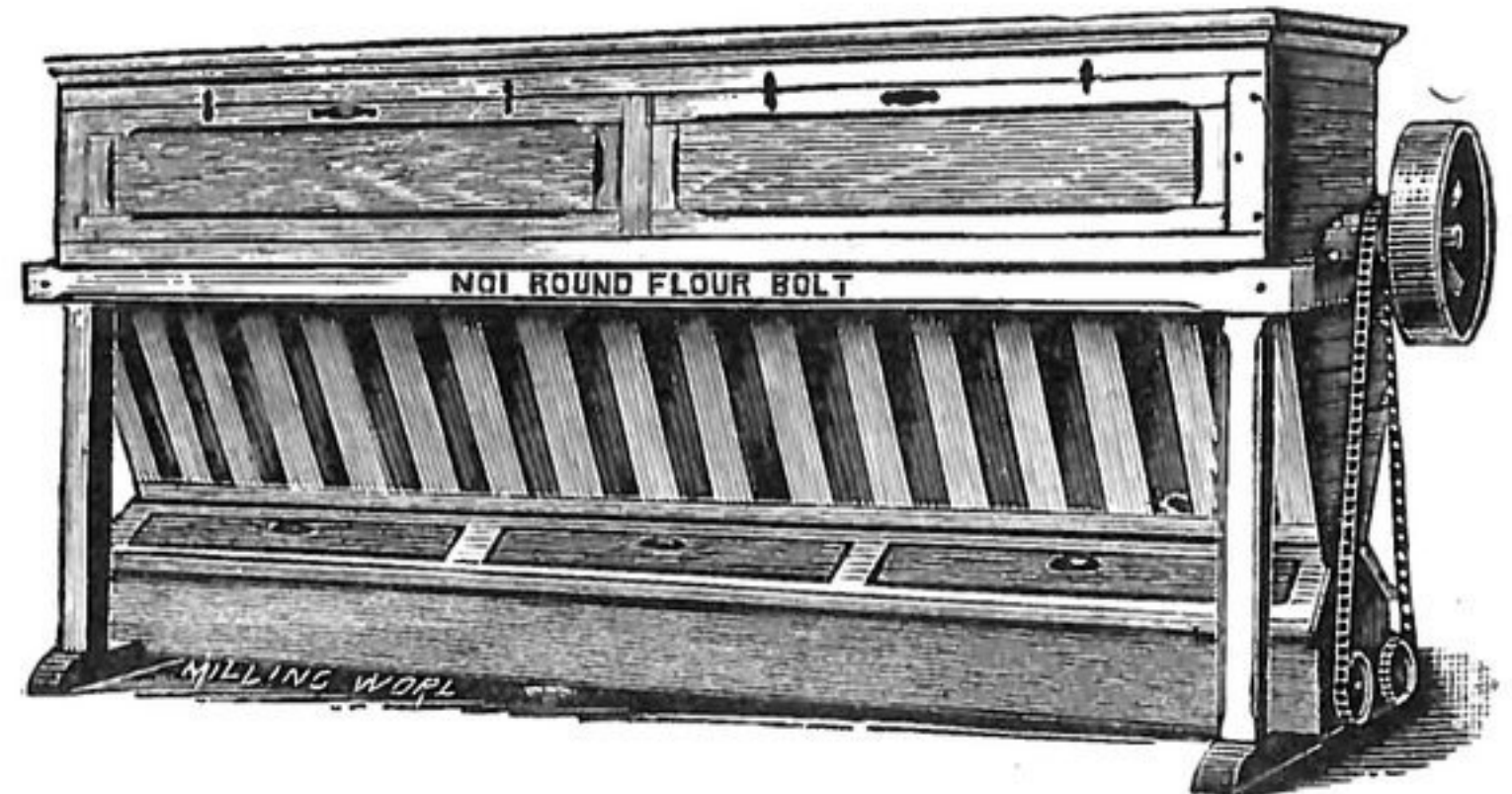
6x15 "

6x20 "

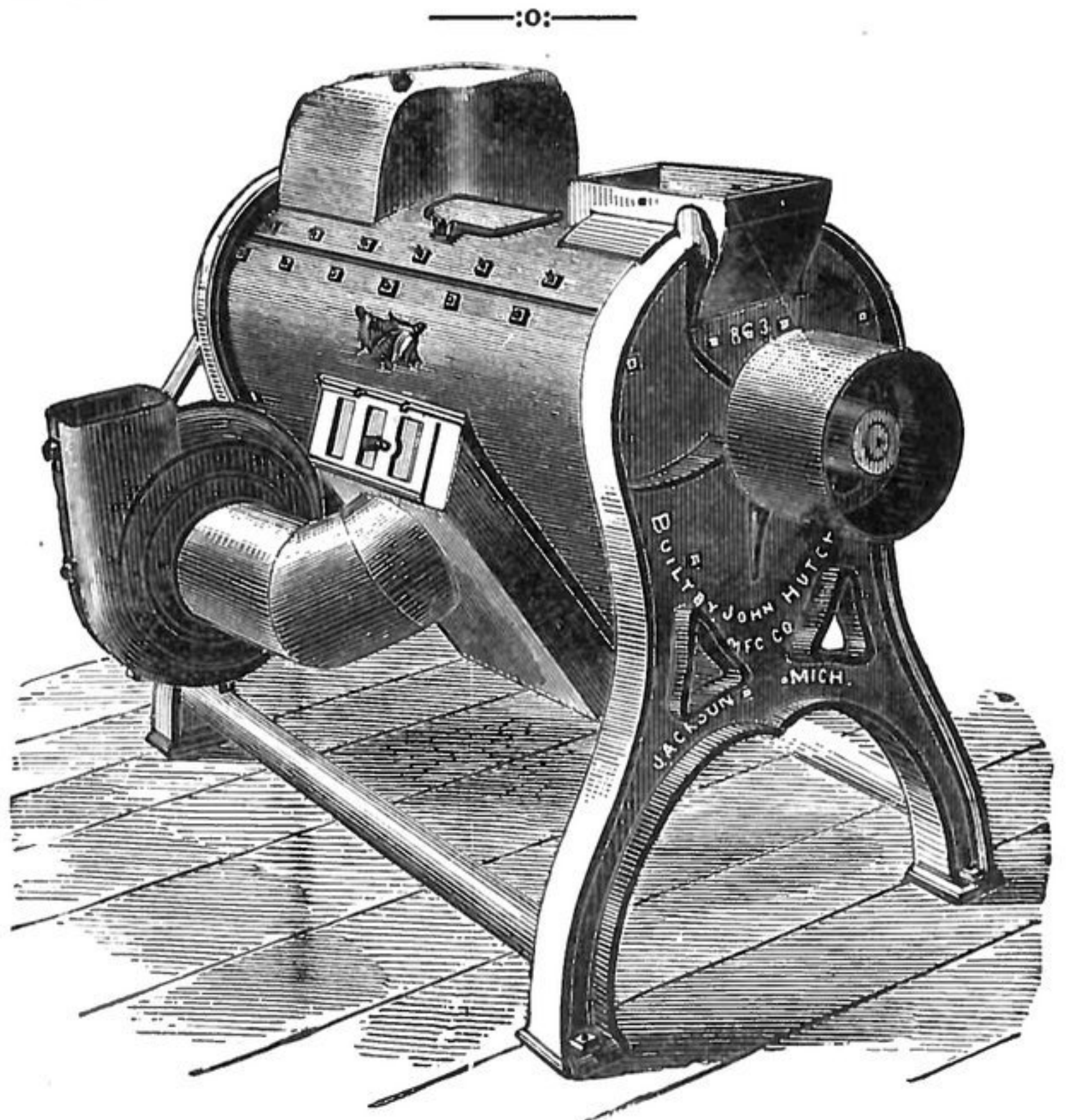


The above cut represents our New Rolling Screen, which is absolutely dustless and has as much scouring qualities as any two scouring machines now being made.

Send for Estimates for Our Full Roller Mills of any Capacity.



The above cut shows our New Round Slow Running Flour Bolt. We also build a Cylinder or Round Scalping Reel and we have lately built a number of new mills of medium capacity, using our Roller Mills, our Round Flour Bolts and Scalping Reels, getting better results than is usually obtained.



Hutchison's New Dustless Iron Corn Sheller, especially adapted for Mill and Elevator use.

—:ADDRESS ALL CORRESPONDENCE TO:—

John Hutchison Mfg. Co.

JACKSON, - - MICHIGAN.

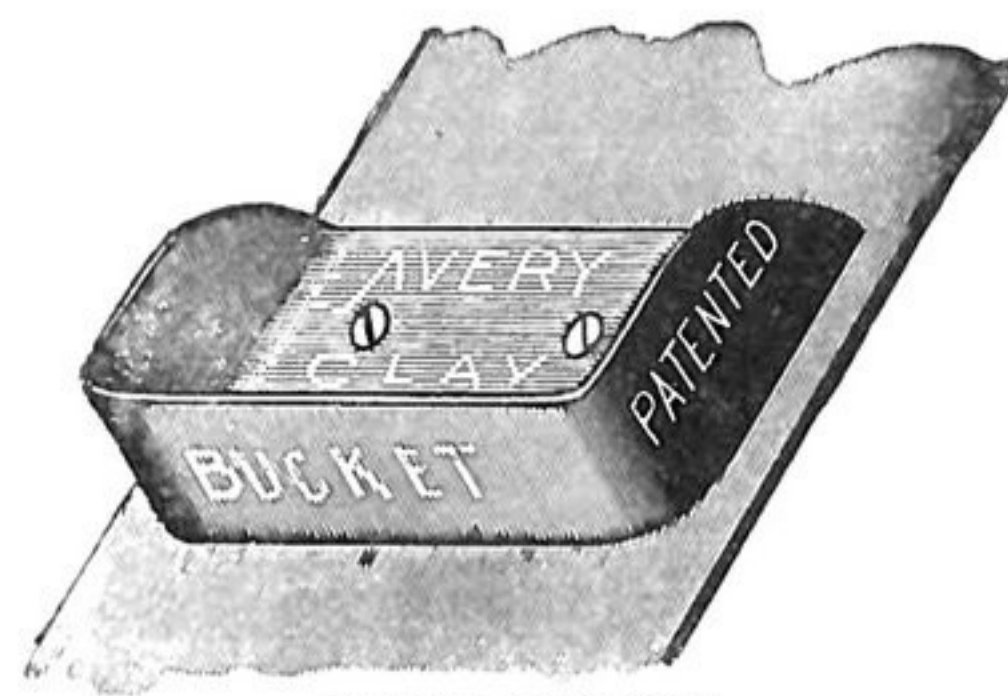


ELEVATOR BUCKET.

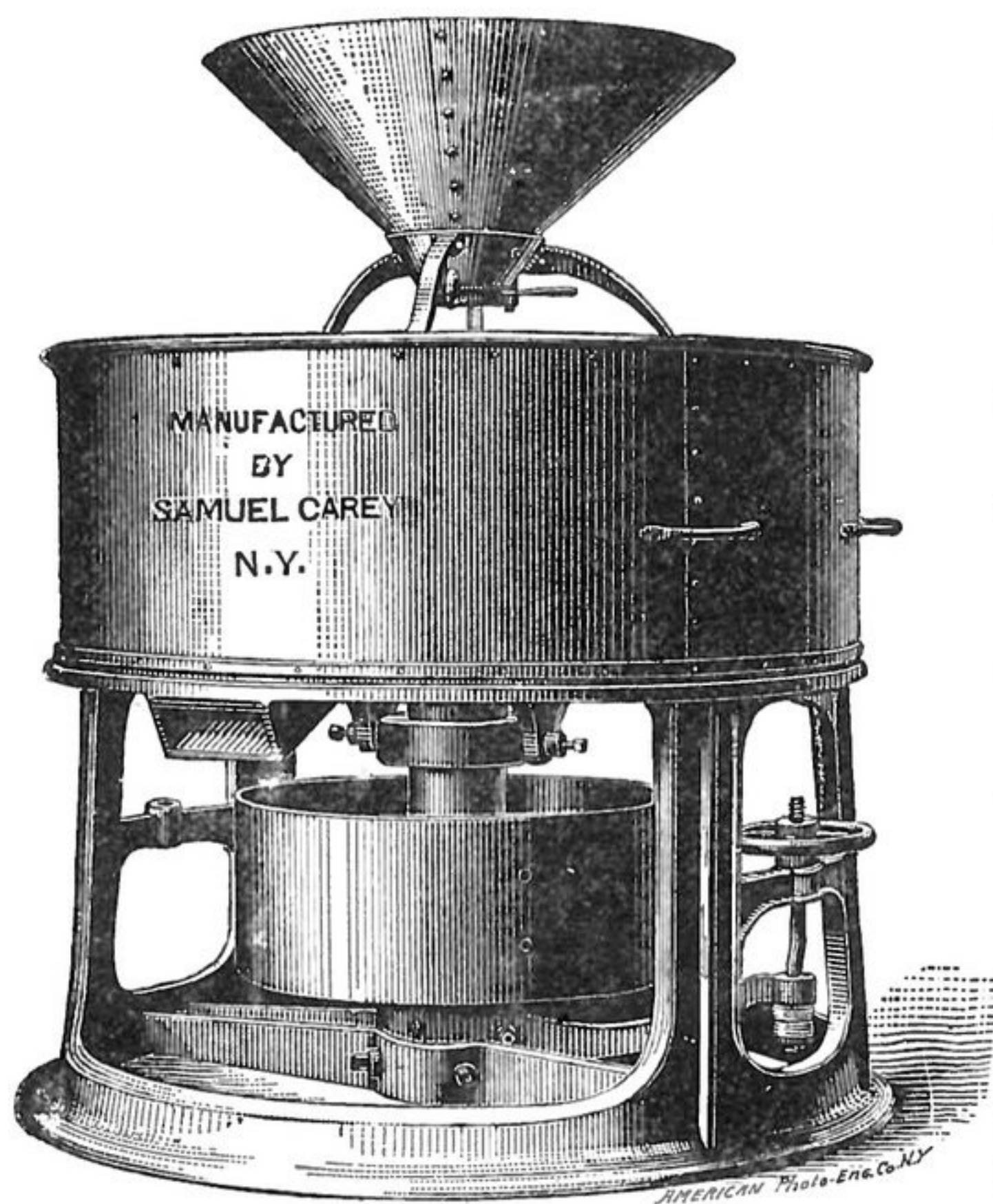
PLEASE NOTICE.

Our patents not only cover Seamless, Drawn, Stamped, Pressed or Forged Elevator Buckets; but also Pre-Date and Cover Round-Cornered Elevator Buckets when made Seamless, and are the Only patents ever issued in the World for a Pressed, Stamped, Drawn or Forged Seamless Elevator Bucket.

THE AVERY STAMPING CO.,
Successors to The Avery Elevator Bucket Co.,
Cleveland, Ohio, U. S. A.



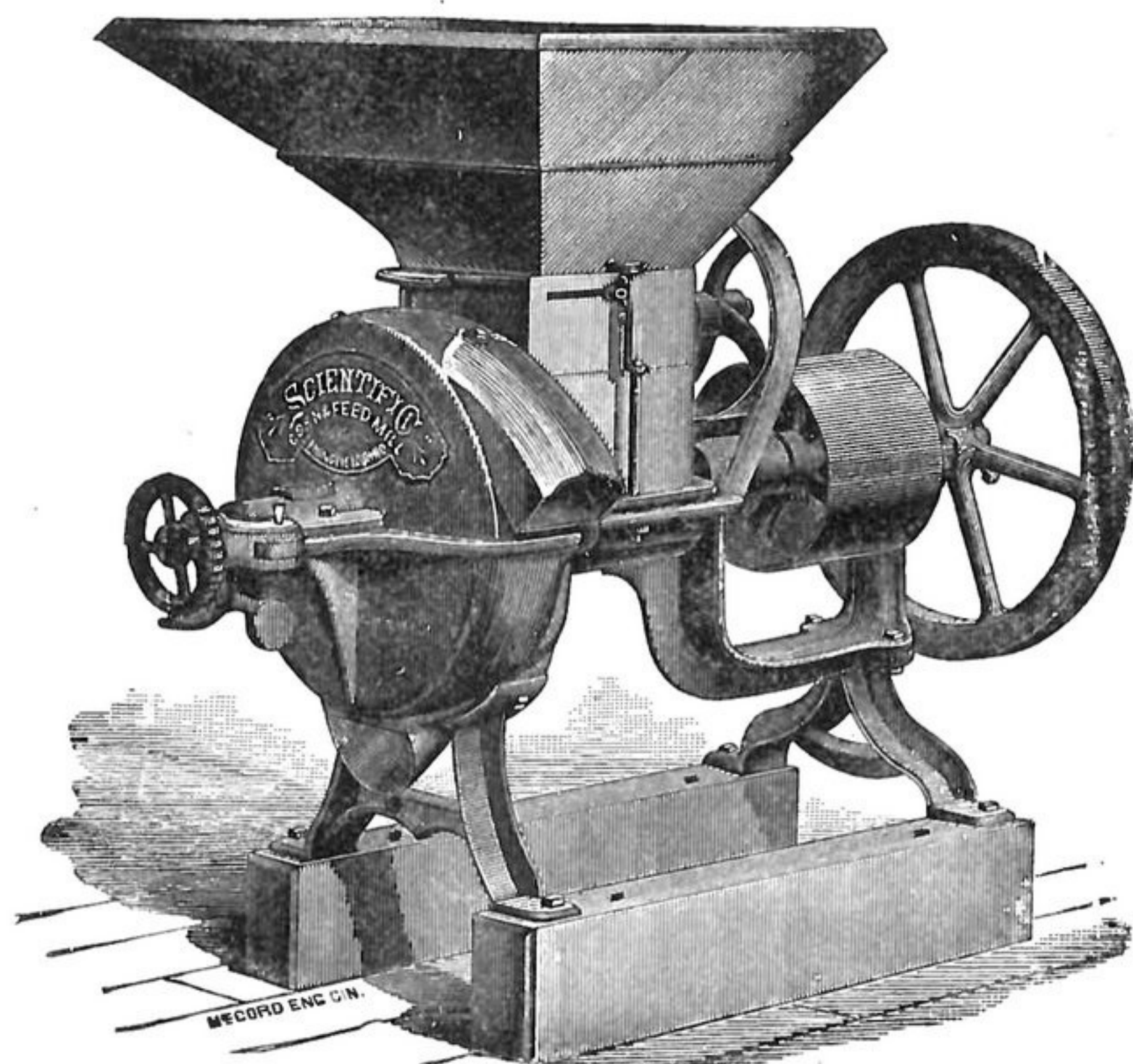
CLAY BUCKET.



SELF-TRAMMING
PORTABLE MILL
BEST GRINDING MILL MADE.
BOLTING CLOTH
WRITE FOR DISCOUNTS.
BURR MILLSTONES
CHEAP.

Send for "SPECIAL PRICES," Giving Size
Wanted, to

SAMUEL CAREY, 17 BROADWAY, NEW YORK



==THE SCIENTIFIC==
GRINDING MILL.

POSITIVELY THE BEST MILL ON EARTH.

GRINDS PERFECTLY, EAR CORN. SHELLED CORN,
AND ALL GRAINS.

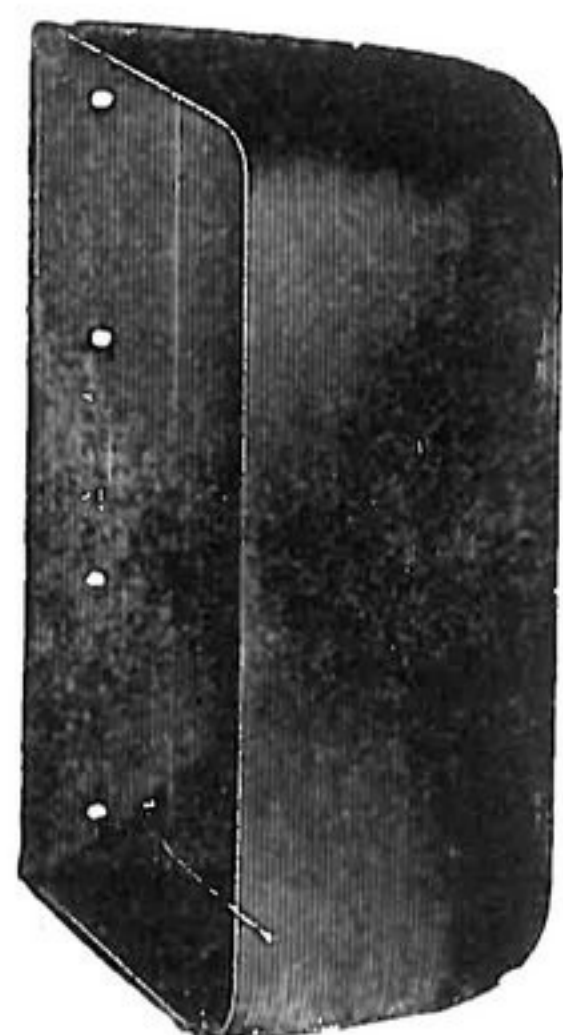
GRINDING PLATES A SPECIAL METAL

*Hard as Steel, Guaranteed to Grind from Five to Eight
Thousand Bushels before wearing out.*

SEND FOR ILLUSTRATED CATALOGUE, PRICES, ETC.

THE FOOS MFG. CO.

SPRINGFIELD OHIO.

STILL ON TOP.

Perhaps the **HIGHEST COMPLIMENT** that could be paid the 'Salem' bucket is the fact that during the past few years ITS SHAPE HAS BEEN SO CLOSELY IMITATED by other manufacturers as to infringe our patented rights, but experience reveals the **IMPERFECTIONS OF IMITATIONS**, and we therefore take it as a **FURTHER COMPLIMENT** to the "SALEM" bucket that some of its old patrons who were *Induced to Try the Imitations have now Returned to the Salem Bucket, thereby Acknowledging it to be the Most Satisfactory.* Don't be deceived by other makes of buckets that are claimed to be "Just as Good." Insist upon having the **ORIGINAL AND RELIABLE SALEM BUCKET.** All legitimate Salem buckets are plainly marked with the word

SALEM

W. J. CLARK & CO., SOLE Manufacturers **SALEM, OHIO.**

THORNBURGH & GLESSNER, General Agents, CHICAGO, ILL.